PROJECT MANUAL

HAMMOND PARK RECREATION CENTER RENOVATION PHASE II

Sandy Springs, Georgia

for

City of Sandy Springs

April 10, 2019

PERMIT SET
ISSUED FOR CONSTRUCTION

Prepared By

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GMC PROJECT NUMBER: AATL160006

SET NO.: ____

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PROJECT MANUAL
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SECTION 013100

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. General coordination procedures.
   2. Coordination drawings.
   3. Request for Information (RFI).
   4. Digital project management procedures.
   5. Project meetings.

1.3 SUBMITTALS:

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
   1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
   2. Number and title of related Specification Section(s) covered by subcontract.
   3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within fifteen (15) days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site.
   1. Identify individuals and their duties and responsibilities; list addresses and cellular telephone numbers and e-mail addresses.
   2. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

   3. Post copies of list in project meeting room, in temporary field office and in prominent location in built facility. Keep list current at all times.

1.4 GENERAL COORDINATION PROCEDURES:

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate

construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination.

1. Include such items as required notices, reports, and list of attendees at meetings.
2. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.5 REQUEST FOR INFORMATION (RFI):

A. RFI Procedure: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.

11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Use AIA Document G716 or software-generated form with substantially the same content as indicated above, acceptable to Architect. Attachments shall be electronic files in PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven (7) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
   a. Requests for approval of submittals.
   b. Requests for approval of substitutions.
   c. Requests for approval of Contractor's means and methods.
   d. Requests for coordination information already indicated in the Contract Documents.
   e. Requests for adjustments in the Contract Time or the Contract Sum.
   f. Requests for interpretation of Architect's actions on submittals.
   g. Incomplete RFIs or inaccurately prepared RFIs.
2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to the General Conditions of the Contract. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within ten (10**)** days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly. Include the following information in the log:
1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven (7) days if Contractor disagrees with response.

1.6 PROJECT MEETINGS:

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of ten (10) working days prior to meeting.
   2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
   3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, and Architect, within three (3) days of the meeting.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than fifteen (15) days after execution of the Agreement.
   1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   2. Agenda: Discuss items of significance that could affect progress, including the following:
      a. Responsibilities and personnel assignments, including designation of key personnel and their duties.
      b. Tentative construction schedule.
      c. Phasing.
      d. Critical work sequencing and long lead items.
      e. Lines of communications.
      f. Procedures for processing field decisions and Change Orders.
      g. Procedures for RFIs.
      h. Procedures for testing and inspecting.
      i. Procedures for processing Applications for Payment.
      j. Distribution of the Contract Documents.
      k. Submittal procedures.
      l. Preparation of Record Documents.
      m. Use of the premises.
      n. Work restrictions.
      o. Working hours.
      p. Owner's occupancy requirements.
      q. Responsibility for temporary facilities and controls.
      r. Procedures for moisture and mold control.
      s. Procedures for disruptions and shutdowns.
      t. Construction waste management and recycling.
      u. Parking availability.
      v. Office, work, and storage areas.
      w. Equipment deliveries and priorities.
      x. First aid.
      y. Security.
      z. Progress cleaning.
   3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.
   1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
   2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
      a. Contract Documents.
      b. Options.
      c. Related RFIs.
      d. Related Change Orders.
      e. Purchases.
      f. Deliveries.
      g. Submittals.
      h. Review of mockups.
      i. Possible conflicts.
      j. Compatibility requirements.
      k. Time schedules.
      l. Weather limitations.
      m. Manufacturer's written instructions.
      n. Warranty requirements.
      o. Compatibility of materials.
      p. Acceptability of substrates.
      q. Temporary facilities and controls.
      r. Space and access limitations.
      s. Regulations of authorities having jurisdiction.
      t. Testing and inspecting requirements.
      u. Installation procedures.
      v. Coordination with other work.
      w. Required performance results.
      x. Protection of adjacent work.
      y. Protection of construction and personnel.
   3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
   4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
   5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than ninety (90) days prior to the scheduled date of Substantial Completion.
   1. Conduct the conference to review requirements and responsibilities related to Project closeout.
   2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned

parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
   a. Preparation of Record Documents.
   b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
   c. Procedures for completing and archiving web-based Project software site data files.
   d. Submittal of written warranties.
   e. Requirements for preparing operations and maintenance data.
   f. Requirements for delivery of material samples, attic stock, and spare parts.
   g. Requirements for demonstration and training.
   h. Preparation of Contractor's punch list.
   i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
   j. Submittal procedures.
   k. Owner's partial occupancy requirements.
   l. Installation of Owner's furniture, fixtures, and equipment.
   m. Responsibility for removing temporary facilities and controls.
4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at monthly intervals.
   1. Coordinate dates of meetings with preparation of payment requests.
   2. Attendees: Representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
   3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
      a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule.
         1) Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so.
         2) Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
         3) Review schedule for next period.
      b. Review present and future needs of each entity present, including the following:
         1) Interface requirements.
         2) Sequence of operations.
         3) Status of submittals.
         4) Deliveries.
         5) Off-site fabrication.
         6) Access.
         7) Site use.
         8) Temporary facilities and controls.
         9) Progress cleaning.

10) Quality and work standards.
11) Status of correction of deficient items.
12) Field observations.
13) Status of RFIs.
14) Status of Proposal Requests.
15) Pending changes.
16) Status of Change Orders.
17) Pending claims and disputes.
18) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
5. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF PROJECT MANAGEMENT AND COORDINATION

SECTION 013300
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
   1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
   2. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule. Submit revised submittal schedule to reflect

changes in current status and timing for submittals.

3. Format: Arrange the following information in a tabular format:
   a. Scheduled date for first submittal.
   b. Specification Section number and title.
   c. Submittal category: Action; informational.
   d. Name of subcontractor.
   e. Description of the Work covered.
   f. Scheduled date for Architect's final release or approval.
   g. Scheduled date of fabrication.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
   3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
   4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
   5. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Submittal Identification: Place a permanent label or title block on each submittal item for identification.
   1. Indicate name of firm or entity that prepared each submittal on label or title block.
   2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
   3. Include the following information for processing and recording action taken:
      a. Project name.
      b. Date.
      c. Name of Architect.
      d. Name of Contractor.
      e. Name of subcontractor.
      f. Name of supplier.
      g. Name of manufacturer.
      h. Submittal number or other unique identifier, including revision identifier.
      i. Number and title of appropriate Specification Section.
      j. Drawing number and detail references, as appropriate.
      k. Location(s) where product is to be installed, as appropriate.
      l. Other necessary identification.
   4. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal. Submit one copy of

submittal to concurrent reviewer in addition to specified number of copies to Architect.

5. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.
   a. Transmittal Form: Use AIA Document G810 or CSI Form 12.1A.
   b. Indicate the following on transmittal:
      1) Project name.
      2) Date.
      3) Destination (To:).
      4) Source (From:).
      5) Name and address of Architect.
      6) Name of Contractor.
      7) Name of firm or entity that prepared submittal.
      8) Names of subcontractor, manufacturer, and supplier.
      9) Category and type of submittal.
      10) Submittal purpose and description.
      11) Specification Section number and title.
      12) Specification paragraph number or drawing designation and generic name for each of multiple items.
      13) Drawing number and detail references, as appropriate.
      14) Indication of full or partial submittal.
      15) Transmittal number, numbered consecutively.
      16) Submittal and transmittal distribution record.
      17) Remarks.
      18) Signature of transmitter.

C. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
   1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
   2. Name file with submittal number or other unique identifier, including revision identifier.
   3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
   4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner**,** containing the following information:
      a. Project name.
      b. Date.
      c. Name and address of Architect.
      d. Name of Contractor.
      e. Name of firm or entity that prepared submittal.
      f. Names of subcontractor, manufacturer, and supplier.
      g. Category and type of submittal.
      h. Submittal purpose and description.
      i. Specification Section number and title.
      j. Specification paragraph number or drawing designation and generic name for each of multiple items.
      k. Drawing number and detail references, as appropriate.

l. Location(s) where product is to be installed, as appropriate.
m. Related physical samples submitted directly.
n. Indication of full or partial submittal.
o. Transmittal number, numbered consecutively.
p. Submittal and transmittal distribution record.
q. Other necessary identification.
r. Remarks.

5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
   a. Project name.
   b. Number and title of appropriate Specification Section.
   c. Manufacturer name.
   d. Product name.

D. Options: Identify options requiring selection by Architect.

E. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

F. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
   1. Note date and content of previous submittal.
   2. Note date and content of revision in label or title block and clearly indicate extent of revision.

G. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

H. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
   1. Submit electronic submittals via email as PDF electronic files.
      a. Architect will return annotated file.
      b. Annotate and retain one copy of file as an electronic Project record document file.
   2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and

certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
   a. Manufacturer's catalog cuts.
   b. Manufacturer's product specifications.
   c. Standard color charts.
   d. Statement of compliance with specified referenced standards.
   e. Testing by recognized testing agency.
   f. Application of testing agency labels and seals.
   g. Notation of coordination requirements.
   h. Availability and delivery time information.
4. For equipment, include the following in addition to the above, as applicable:
   a. Wiring diagrams showing factory-installed wiring.
   b. Printed performance curves.
   c. Operational range diagrams.
   d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
5. Submit Product Data before or concurrent with Samples.
6. Submittal Method: Submit Product Data in PDF electronic file format.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   a. Identification of products.
   b. Schedules.
   c. Fabrication and installation drawings.
   d. Roughing-in and setting diagrams.
   e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
   f. Templates and patterns.
   g. Compliance with specified standards.
   h. Notation of coordination requirements.
   i. Notation of dimensions established by field measurement.
   j. Relationship and attachment to adjoining construction clearly indicated.
   k. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 40 inches.
3. Submittal Method: Submit Shop Drawings PDF electronic file format.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:
   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of applicable Specification Section.
   e. Specification paragraph number and generic name of each item.
3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
   a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line.
   b. Architect will return submittal with options selected.
5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected.
   a. Samples include, but are not limited to partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
   b. Number of Samples: Submit three (3) sets of Samples. Architect will retain one Sample set; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
      1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit

at least three sets of paired units that show approximate limits of variations.

E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location.
   1. Include the following information in tabular form:
      a. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
      b. Manufacturer and product name, and model number if applicable.
      c. Number and name of room or space.
      d. Location within room or space.
   2. Submittal Method: Submit product schedule in PDF electronic file format.

F. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Division 1 Section "Quality Requirements."

G. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 1 Section "Project Closeout."

H. Maintenance Data: Comply with requirements specified in Division 1 Section "Project Closeout."

I. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

J. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents.
   1. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms.
   2. Include names of firms and personnel certified.

K. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

L. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

M. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

N. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

O. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

P. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

Q. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

R. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

S. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

T. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

U. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations.
1. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable.
2. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file and three (3) paper copies of certificate, signed and sealed by the responsible design professional, for

each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents.
2. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S REVIEW

A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:

1. "NO EXCEPTIONS TAKEN" indicates that fabrication may begin on all items.
2. "REJECTED" indicates that the submission is unacceptable and requires resubmission. In the case of mock-up, reconstruction will be required. Contractor shall make corrections as noted and resubmit. Fabrication shall not begin on items covered by shop drawings bearing this notation.
3. "MAKE CORRECTIONS NOTED" indicates that Contractor shall make the corrections indicated on the returned submittal. This notation will permit fabrication to begin on all items subject to the corrections indicated.
4. “AMEND AND RESUBMIT” indicates that contractor shall delay fabrication on items affected by the corrections, make appropriate changes and resubmit.
5. "SUBMIT SPECIFIED ITEM" indicates that the item submitted is not specified and unacceptable. Submittal will be returned without review. Only the item specified is to be submitted for review.

B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SUBMITTAL PROCEDURES

SECTION 014000
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

B. Section includes administrative and procedural requirements for quality assurance and quality control.

C. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances.
1. Mockups are not Samples.
2. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five (5) previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 SUBMITTALS

A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:

B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

1.6 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
   1. Name, address, and telephone number of factory-authorized service representative making report.
   2. Statement that equipment complies with requirements.
   3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   4. Statement whether conditions, products, and installation will affect warranty.
   5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations.
   1. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
   2. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an A2LA independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in

individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
3. A2LA: A testing agency accredited by the American Association for Laboratory Accreditation.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:
    a. Provide test specimens representative of proposed products and construction.
    b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    d. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
    e. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect seven (7) days in advance of dates and times when mockups will be constructed.
3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.

5. Obtain Architect's approval of mockups before starting work, fabrication, or construction. Allow seven (7) days for initial review and each re-review of each mockup.
6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
7. Demolish and remove mockups when directed unless otherwise indicated.

1.8 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
3. Notify testing agencies at least twenty-four (24) hours in advance of time when Work that requires testing or inspecting will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination:
1. Coordinate sequence of activities to accommodate required quality assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
2. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.9 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency and special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner**,** and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
   1. Date test or inspection was conducted.
   2. Description of the Work tested or inspected.
   3. Date test or inspection results were transmitted to Architect.
   4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes.
   2. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
   3. Comply with the Contract Document requirements for cutting and patching in Division 1 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF QUALITY REQUIREMENTS

SECTION 014200
REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS:

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. Indicated: The term "indicated" refers to graphic representations, notes or schedules on the Drawings, or other Paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.

C. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Architect," "requested by the Architect," and similar phrases.

D. Approve: The term "approved," where used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.

E. Regulation: The term "Regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. Furnish: The term "furnish" is used to mean "supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations."

G. Install: The term "install" is used to describe operations at project site including the actual "unloading, temporary storage, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations."

H. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

I. Installer:

1. An "Installer" is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

2. The term "experienced," when used with the term "Installer," means having a minimum of five previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of the authority having jurisdiction.

3. Trades: Use of titles such as "carpentry" is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

J. Project Site is the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other work as part of the Project.

1. The extent of the Project Site is shown on the Drawings, and may or may not be identical with the description of the land on which the Project is to be built.

2. If areas available are not indicated, they will be as mutually agreed by Owner and Contractor at Preconstruction Conference and as modified during construction.

K. Testing Laboratories: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION:

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 2004 MASTERFORMAT numbering system with 49-Division format.

B. Specification Content: This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language:
   a. Language used in Specifications and other Contract Documents is the abbreviated type. Words and meanings shall be interpreted as appropriate.
   b. Words that are implied, but not stated shall be interpolated as the sense required.
   c. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and the context of the Contract Documents so indicates.

2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.

1.4 INDUSTRY STANDARDS:

A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with the standard in effect as of the date of the Contract Documents.

C. Conflicting Requirements:

1. Where compliance with two or more standards is specified, and the standards may establish different or conflicting requirements for minimum quantities or quality levels. Refer requirements that are different, but apparently equal, and uncertainties to the Architect for a decision before proceeding.

2. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.

D. Copies of Standards:

1. Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.

2. Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.

1.5 DRAWING SYMBOLS:

A. General: Except as otherwise indicated, graphic symbols used on drawings are those symbols recognized in the construction industry for purposes indicated. Where not otherwise noted, symbols are defined by "Architectural Graphic Standards", published by John Wiley & Sons, Inc., seventh edition.

B. Mechanical/Electrical Drawings: Graphic symbols used on mechanical and electrical drawings are generally aligned with symbols recommended by ASHRAE. Where appropriate, these symbols are supplemented by more specific symbols as recommended by other recognized technical associations including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to the Architect/Engineer for clarification before proceeding.

1.6 SUBMITTALS:

A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and

records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 - PRODUCTS: (Not Used)

PART 3 - EXECUTION (Not Used)

END OF REFERENCE STANDARDS AND DEFINITIONS

SECTION 015000
TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 TEMPORARY FACILITIES:

A. Proper provision shall be made for storage of bulk materials, parking of construction vehicles and direct access to the building site as acceptable to the Owner and approved by the Architect.

B. Site Parking: On-site parking will be available to the Contractor within the "staging areas" indicated, or if not indicated, as agreed to and designated by the Owner.

C. Field Offices: At the Contractor's option (not required), provide temporary field offices of sufficient size to accommodate Contractor's requirements at the project site.

D. Digital Camera: Provide no less than 5 megapixels resolution, with 5× zoom, for daily construction documentation at the site, including flash, memory cards, charger and rechargeable batteries, standard batteries as back-up or for primary use, and all standard accessories and hardware for equipment, for complete and proper operation, and for downloading and emailing.

1.3 TOILET FACILITIES:

A. Contractor shall provide temporary toilet(s) on site for the duration of the project, for construction personnel use. They shall be enclosed weatherproof and sanitary toilets.

1. Maintain toilets in sanitary condition at all times. Remove outside toilets when no longer required, and leave site in clean condition.

2. Conform to local ordinances and regulations.

B. Toilet facilities in the Owner's buildings are not available to, and shall not be used by, the Contractor, subcontractors, and construction personnel.

1.4 TEMPORARY TELEPHONES:

A. Provide telephone for Contractor and Architect in the Contractor's job office at the project site, or if no on-site office is provided, provide a portable or cellular telephone to the Contractor's Superintendent. Cost of service and local calls shall be paid by General Contractor. Long distance and toll calls shall be paid by the party making such calls.

B. Provide telephone answering machine or service (or "voice mail" for cellular phone), to facilitate communication with the Contractor's Superintendent.

C. The Owner's telephones are not available to, and shall not be used by, the Contractor, except in an emergency situation.

1.5 TEMPORARY BARRIERS AND FENCES:

A. Contractor shall provide and maintain adequate fencing, barricades and protective walkways where required to provide suitable protection for employees, children, and the public at all times until completion of the work, acceptable to authorities having jurisdiction.

B. The Contractor shall confine the activities of work on this project to within the protected areas, unless otherwise directed by the Architect or Owner.

1.6 ELECTRIC POWER:

A. The Owner will provide electric service for reasonable use, as necessary for this project and any demolition and/or construction to continue without interruption, to the extent it is available at the site, and shall pay the power bills for such use for the duration of the Work of this Contract. Otherwise, the Contractor shall obtain the service from the local power company. Cost of temporary power from the local power company and related billings shall be paid by the Contractor from their Contract amount.

B. Use of Owner's existing on-site power service shall be limited to 110V/120V hand tools, lighting, or other use acceptable to the Owner.

C. Where need for electricity exists for use of other than 110V/120V hand tools or lighting, the Contractor shall provide temporary non-vibrating or vibration isolated portable generator with muffler in compliance with local noise ordinances, or other acceptable power source.

D. The Contractor shall be responsible for all extensions and connections required for the Work. Contractor shall remove all temporary wiring, extensions and connections prior to Substantial Completion.

E. The Contractor shall protect the Owner's systems from outage or damage, and repair of any damage to at least its previously existing condition - subject to the Owner's approval.

1.7 WATER:

A. The Owner will provide water for reasonable use, as necessary for this project and any construction, and/or demolition to continue without interruption, to the extent it is available at the site, and shall pay the water bills for such use for the duration of the Work of this Contract. Otherwise, the Contractor shall obtain the service from the local utility company. Cost of temporary water from the utility company and related billings shall be paid by the Contractor from their Contract amount.

B. The Contractor shall provide temporary stub-up, connections, valves and hose bibs required for the Work. Contractor shall remove all temporary piping, valves and other related connections prior to Substantial Completion.

C. The Contractor shall protect the Owner's water systems, new and temporary water lines valves and related connections from freezing, damage and contamination, and repair of any damage to the Owner's water systems to at least its previously existing condition - subject to the Owner's approval.

1. Where new water service is indicated to be installed, the Owner will pay for reasonable use of water from this new source.

2. However, the Contractor shall be responsible for any and all costs associated with the procurement and installation of any new meters, all fees for service connection, permits, tap fees, impact fees, and pay for same from the Contract amount.

1.8 TEMPORARY HEAT:

A. Contractor shall furnish temporary heat as required for uninterrupted construction and other operations, protection of new work, for drying out buildings and for curing of completed installations. Select equipment that will not have a harmful effect on completed installations or elements being installed.

1.9 ENCLOSURES AND PROTECTION:

A. Provide and maintain for the duration of construction of scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges and other temporary construction necessary for proper completion and observation of the work, in compliance with pertinent safety and other regulations, and authorities having jurisdiction.

1.10 CLEAN UP:

A. The Contractor or his agent, upon completion of the work shall immediately remove all temporary fences, temporary utility lines, debris or any other obstructions and leave such property in as good a condition as it was before such work was commenced.

B. The Contractor, upon completion of the work, shall remove all other temporary structures and facilities from the site.

C. The Contractor shall legally dispose of all trash, debris, and construction waste, off site, on a regular basis.

D. Items salvaged by Contractor for his own purposes or for the Owner where indicated, may be stored temporarily on site and removed as soon as possible, unless directed otherwise by Architect, or Owner.

E. The sale or advertising for sale of salvaged or other materials *shall not be permitted* on site under any circumstances.

F. Control dust on site and clean mud and/or debris from on site and city streets and sidewalks, as it occurs.

G. Provide facilities to wash mud off of truck tires and equipment before it can be tracked onto streets, roads or public thoroughfares.

END OF TEMPORARY FACILITIES

SECTION 016000
PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
   3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design" including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

C. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.4 SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request.

a. Architect will notify Contractor of approval or rejection of proposed comparable product request within fifteen (15**)** days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.

b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Use CSI Form 13.1A.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    a. Statement indicating why specified material or product cannot be provided.
    b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    e. Samples, where applicable or requested.
    f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
    i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter

from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.

j. Cost information, including a proposal of change, if any, in the Contract Sum.

k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.

l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

a. Form of Acceptance: Change Order.

b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.

3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Submittal Time: Comply with requirements in Division 1 Section "Project Closeout."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies

with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

3. Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers.

a. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named.
b. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample.
1. Architect's decision will be final on whether a proposed product matches.
2. If no product is available within specified category matches and complies with other specified requirements, comply with requirements in "Product Substitution" Article for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

A. Requests for substitution shall reach the Architect not less than ten (10) calendar days prior to the date set for Bid opening. Requests received by Architect after this date will not be considered.

B. Architect will consider Contractor's request for substitution in accordance with conditions and procedures described in the Instructions to Bidders.

C. Conditions for Consideration: Architect will consider Contractor's request for substitution when the following conditions are satisfied.
1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.

5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.
10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

D. Architect will determine acceptability of proposed substitutions. In accepting a substitution the Architect does not warrant that the product meets all expressed requirements of the Contract Documents. The approved substitution is subject to the same subsequent review and approval procedures as the products originally specified.
1. Determination as to acceptability of proposed substitutions will be made based only on data submitted.
2. Substitute products shall not be ordered or installed without written acceptance by the Architect.

E. Contractor shall coordinate installation of accepted substitutions with interfacing work, bearing re-design costs and making approved changes in the Work to properly incorporate the substitutions, and shall waive all claims for additional costs related to use of acceptable substitutions which become apparent following acceptance.

2.3 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF PRODUCT REQUIREMENTS

SECTION 017329
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF REQUIREMENTS:

A. Definition:
1. Cutting and patching includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required to restore surfaces to their original condition.
2. Cutting and patching is performed for coordination of the Work, to uncover work for access or inspection, to obtain samples for testing, to permit alterations to be performed or for other similar purposes.
3. Cutting and patching performed during the manufacture of products, or during the initial fabrication, erection or installation processes is not considered to be "cutting and patching" under this definition. Drilling of holes to install fasteners and similar operations are also not considered to be "cutting and patching".

1.3 SUBMITTALS:

A. Procedural Proposal for Cutting and Patching:
1. Where prior approval of cutting and patching is required, submit proposed procedures for this work well in advance of the time work will be performed and request approval to proceed. Include the following information, as application, in the submittal.
2. Describe nature of the work and how it is to be performed, indicating why cutting and patching cannot be avoided. Describe anticipated results of the work in terms of changes to existing work, including structural, operational and visual changes as well as other significant elements.
3. List products to be used and firms that will perform work.
4. Give dates when work is expected to be performed.
5. List utilities that will be disturbed or otherwise be affected by work, including those that will be relocated and those that work be out-of-service temporarily. Indicate how long utility service will be disrupted.
6. Approval by the Architect/Engineer to proceed with cutting and patching work does not waive the Architect/Engineer’s right to later require complete removal and replacement of work found to be cut and patched in an unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. General: Except as otherwise indicated, or as directed by the Architect/Engineer, use materials for cutting and patching that are identical to specified materials. If identical materials are not available, or cannot be used, use materials that match adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials for cutting and patching that will result in equal-or-better performance characteristics.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Before cutting, examine the surfaces to be cut and patched and the conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the work.

3.2 PREPARATION:

A. Temporary Support: To prevent failure provide temporary support of work to be cut.

B. Protection:
1. Protect other work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for that part of the project that may be exposed during cutting and patching operations.
2. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
3. Take precautions not to cut existing pipe, conduit or duct serving the building but scheduled to be relocated until provisions have been made to bypass them.

3.3 PERFORMANCE:

A. General: Employ skilled workmen to perform cutting and patching work. Except as otherwise indicated or as approved by the Architect/Engineer, proceed with cutting and patching at the earliest feasible time and complete work without delay.

B. Cutting:
1. Cut the work using methods that are least likely to damage work to be retained or adjoining work. Where possible review proposed procedures with the original installer; comply with original installer's recommendations.
2. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut through concrete and masonry using a cutting machine such as a carborundum saw or core drill to insure a neat hole. Cut holes and slots neatly to size required with minimum disturbance of adjacent work. To avoid marring existing finished surfaces, cut or

drill from the exposed or finished side into concealed surfaces. Temporarily cover openings when not in use.

C. Patching:
1. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.
2. Where feasible, inspect and test patched areas to demonstrate integrity of work.
3. Restore exposed finishes of patched areas and where necessary extend finish restoration into retained adjoining work in a manner which will eliminate evidence of patching and refinishing.
4. Where patch occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing patch, after patched area has received prime and base coat.
5. Patch, repair or rehang existing ceilings as necessary or called for on plans to provide an even plane surface of uniform appearance.

3.4 CLEANING:

A. Thoroughly clean areas and spaces where work is performed or used as access to work. Remove completely point, mortar, oils, putty and items of similar nature.

B. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF CUTTING AND PATCHING

SECTION 017720
PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF REQUIREMENTS:

A. Definitions:

1. Project closeout is the term used to describe certain collective project requirements, indicating completion of the Work that are to be fulfilled near the end of the Contract time in preparation for final acceptance and occupancy of the Work by the Owner, as well as final payment to the Contractor and the normal termination of the Contract.

2. Specific requirements for individual units of work are included in the appropriate sections in Divisions 2 through 33.

3. Time of closeout is directly related to "Substantial Completion"; therefore, the time of closeout may be either a single time period for the entire Work or a series of time periods for individual elements of the Work that have been certified as substantially complete at different dates, if the Work is to be completed in phases. This time variation, if any, shall be applicable to the other provisions of this section.

1.3 PREREQUISITES TO SUBSTANTIAL COMPLETION:

A. General: Complete the following before requesting the Architect/Engineer's inspection for certification of substantial completion, either for the entire Work or for portions of the Work, if the Work is to be completed in phases. List known exceptions in the request.

1. Inspection Procedures:
   a. The Contractor shall conduct their own complete Prefinal Inspections, distribute punchlists to all trades, the Owner, Architect and their Consultants, and complete all resulting work items, prior to any Final Inspection by the Architect or their Consultants.
   b. Following the Contractor's completion of work resulting from their own inspection(s), and upon receipt of the Contractor's request for inspection, the Architect/Engineer will either proceed with inspection or advise the Contractor of unfilled prerequisites.
   c. Following the initial inspection, the Architect/Engineer will either prepare the certificate of substantial completion, or will advise the Contractor of work which must be performed before the certificate will be issued. The Architect/Engineer will repeat the inspection when requested and when assured that the Work has been substantially completed.

d. Results of the completed inspection will form the initial "punch-list" for "final acceptance".

2. In the progress payment request that coincides with, or is the first request following, the date substantial completion is claimed, show either 100% completion for the portion of the Work claimed as "substantially complete", or list incomplete items, the value of incomplete work, and reasons for the Work being incomplete.

3. Submit a statement showing an accounting of changes to the Contract Sum.

4. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents.

5. Obtain and submit releases enabling the Owner's unrestricted use of the Work and access to services and utilities. Where required, include occupancy permits, operating certificates, and other similar releases.

6. Deliver tools, spare parts, extra stock of material, and similar physical items to the Owner.

7. Make the final change-over of locks and transmit the keys to the Owner. Advise the Owner's personnel of the change-over in security provisions.

8. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities and services from the project site, along with construction tools and facilities, mock-ups, and similar elements.

1.4 PREREQUISITES TO FINAL ACCEPTANCE:

A. General: Complete the following before requesting the Architect/Engineer's final inspection for certification of final acceptance, and final payment as required by the General Conditions. List known exceptions, if any, in the request.

1. Submit the final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Architect/Engineer's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and which has been endorsed and dated by the Architect/ Engineer.

4. Submit final meter readings for utilities, a measured record of stored fuel, and similar date either as of the date of substantial completion, or else when the Owner or subsequent Contractor took possession of and responsibility for corresponding elements of the Work.

5. Submit consent of surety.

6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

7. Include supporting documentation for completion as indicated in these contract documents.

B. Reinspection Procedure:

1. The Architect/Engineer will reinspect the Work upon receipt of the Contractor's notice that the Work, including punch-list items resulting from earlier inspections, has been completed, except for these items whose completion has been delayed because of circumstances that are acceptable to the Architect/Engineer.

2. Upon completion of reinspection, the Architect/Engineer will either prepare a certificate of final acceptance, or will advise the Contractor of work that is incomplete or of obligations that have not been fulfilled, but are required for final acceptance.

3. If necessary, the reinspection procedure will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS:

A. General:

1. Specific requirements for record documents are indicated in the individual sections of these specifications. Other requirements are indicated in the General Conditions. General submittal requirements are indicated in the various "submittals" sections.

2. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistant location; provide access to record documents for the Architect/Engineer's reference during normal working hours.

B. Record Drawings:

1. Maintain a record set of blue or black line white-prints of contract drawings and shop drawings in a clean, undamaged condition.
   a. Mark-up the set of record documents to show the actual installation where the installed work varies substantially from the work as originally shown.
   b. Mark whichever drawing is most capable of showing the actual "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at the corresponding location on the working drawings.
   c. Give particular attention to concealed work that would be difficult to measure and record at a later date.

2. Mark record sets with red erasable pencil and, where feasible, use other colors to distinguish between variations in separate categories of work.

3. Mark-up new information which is know to be important to the Owner, but for same reason was not shown on either contract drawings or shop drawings.

4. Note related change-order numbers where applicable.

5. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

C. Record Specifications: Maintain one complete copy of the Project Manual, including specifications and addenda(s), and one copy of other written construction documents such as change orders and similar modifications issued in printed for during construction.

1. Mark these documents to show substantial variations in the actual work performed in comparison with the text of the specifications and modifications as issued.

2. Give particular attention to substitutions, selection of options and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation.

3. Note related record drawing information and product data, where applicable.

4. Upon completion of the Work, submit record specifications to the Architect/Engineer for the Owner's records.

D. Record Sample Submitted: Immediately prior to the date or dates of substantial completion, the Contractor will meet at the site with the Architect/Engineer and the Owner's personnel, if desired, to determine which, if any, of the submitted samples that have been maintained by the Contractor during progress of the Work, are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's sample storage area.

E. Miscellaneous Record Submittals: Refer to other sections of these specifications for requirements of miscellaneous record-keeping and submittals in connection with the actual performance of the Work. Immediately prior to the date or dates of substantial completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect/Engineer for the Owner's records.

F. Maintenance Manuals, Warranties, and Guarantees:

1. Unless indicated otherwise, submit one (1) original and one (1) copy of each item required by the Project Manual.

2. Furnish to Architect for review, and then to Owner, in two (2) separate sets bound in three-ring binders, permanently and clearly identifying the project and contents on front and edge.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES:

A. General Operating and Maintenance Instructions:

1. Arrange for each installer of operating equipment and other work that requires regular or continuing maintenance, to meet at the site with the Owner's personnel to provide necessary basic instruction in the proper operation and maintenance of

the entire Work. Where installers are not experienced in the required procedures, include instruction by the manufacturer's representatives.

2. As part of this instruction, provide a detailed review of the following items:
   a. Maintenance manuals
   b. Record documents
   c. Spare parts and materials
   d. Tools
   e. Identification systems
   f. Control sequences
   g. Cleaning procedures
   h. Warranties, bonds, maintenance agreements, and similar continuing commitments.

3. As a part of this instruction for operating equipment, demonstrate the following procedures:
   a. Start-up
   b. Shut-down
   c. Emergency operations
   d. Noise and vibration adjustments
   e. Safety procedures
   f. Economy and efficiency adjustments
   g. Effective energy utilization.

3.2 FINAL CLEANING:

A. General: Special cleaning requirements for specific units of Work are included in the appropriate sections of Divisions 2 through 16. General Cleaning during the regular progress of the Work is required by the General Conditions and is included under section "Temporary Facilities".

B. Cleaning: Provide final cleaning of the Work at the time indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of work to the condition expected from a normal, commercial building cleaning and maintenance program. Comply with the manufacturer's instructions for operations.

C. Complete the following cleaning operations before requesting the Architect/Engineer's inspection for certification of substantial completion:

1. Clean the project site, including landscape development areas, of rubbish, litter and other foreign substances.

2. Sweep paved areas to a broom clean condition; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

D. Removal of Protection: Except as otherwise indicated or requested by the Architect/Engineer, remove temporary protection devices and facilities which were installed during the course of the work to protect previously completed work during the remainder of the construction period.

E. Compliance:

1. Comply with safety standards and governing regulations for cleaning operations. Remove waste materials from the site and dispose of in a lawful manner.
2. Do not burn waste materials at the site.
3. Do not bury debris or excess materials on the Owner's property.
4. Do not discharge volatile or other harmful or dangerous materials into drainage systems.
5. Where extra materials of value remaining after completion of associated work have become the Owner's property, dispose of these materials to the Owner's best advantage as directed.

END OF PROJECT CLOSEOUT

SECTION 017839
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.2 DOCUMENTS:

A. Maintain at least one (1) copy of all drawings, specifications, addenda, approved shop drawings, change orders, filed orders, other contract modifications and other reviewed documents submitted by the Contractor in compliance with various sections of the specifications.

1.3 IDENTIFICATION AND MAINTENANCE:

A. Each of these project record documents shall be clearly marked "Project Record Copy," maintained in good condition, available for inspection by the Architect or Owner, and not used for construction purposes.

1.4 RECORDS:

A. Mark up the most appropriate documents with permanent red ink pen or red pencil to show:

1. Significant changes made during the construction progress.
2. Significant detail not shown in the original contract documents.

B. The information given shall include, but not be limited to the location of underground utilities and appurtenances, referenced to permanent surface improvements by dimensions(s) and description(s).

C. Keep project record documents current. Do not permanently conceal any work until the required information has been recorded.

D. As-built Drawings: At completion of project, the Contractor shall submit to Architect complete sets of marked-up Project Record Drawings, as follows:

1. One (1) Original Set.
2. One (1) set, blueline or blackline prints or copies.
3. Two (2) sets of digital copies in latest edition of ISO/Adobe compliant "Portable Document Format" (PDF) saved as "Read Only" on compact discs (CD's), clearly and permanently labeled as to their contents. Minimum Resolution shall be 300 dpi for small format documents and 600 dpi for large format documents ("large format" is defined as larger than 11-inches by 17-inches).
   a. Original documents which include color, colored markings, etc., shall be scanned and saved as color documents. Documents may be saved in a

non-proprietary ISO compliant self-extracting compressed file format, and no documents shall be password protected.

b. Deliver in standard CD cases or sleeves which are free of any PVC content, also clearly and permanently labeled.

E. As-Built Project Manual and Specifications: At completion of project, the Contractor shall submit to Architect complete sets of marked-up Project Record Specifications, in same quantities and formats as required for the As-built Drawings.

1.5 SUBMITTALS:

A. Submit project record documents and as-built drawings within ten (10) days of acceptance of the entire completed project.

END OF PROJECT RECORD DOCUMENTS

SECTION 024120

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. This Section requires the selective removal and subsequent offsite disposal of the following:

1. Portions of existing interior and exterior construction and improvements indicated on Drawings, and as otherwise required to accommodate new construction.
2. Removal of existing improvements indicated "remove", or similar indication.
3. Removal and protection of existing fixtures, materials, and equipment items indicated "salvage," or otherwise to be re-used. Refer to other Sections of Project Manual, including and Drawings for additional information and requirements.
4. The work described in this Section, by other referenced Sections and Regulations, and by authorities having jurisdiction, require in part, that the Contractor and any Specialty Subcontractors for removal of any mold/mildew and any hazardous materials encountered, shall be knowledgeable of and comply with current regulations regarding removal, handling, worker safety, environmental safety, and legal disposal of hazardous materials.
5. Compliance with all Federal and State regulations regarding building demolition and disposal, including in part and where applicable, any thermostats and other items containing mercury, fluorescent light bulbs, transformers, ballasts, PCB’s, capture of Freon, etc.

B. Related work specified elsewhere:

1. Remodeling, construction work, and patching are included within the respective sections of specifications, including removal of materials for reuse and incorporation into remodeling or new construction, and/or delivery of salvage items to Owner at on site location indicated.
2. Relocation of pipes, conduits, ducts, and other mechanical and electrical work is specified in other Divisions, and/or indicated on the Drawings.

1.3 SUBMITTALS:

A. Demolition Schedules: Submit schedules indicating proposed sequence of operations for selective demolition work to Owner’s Representative for review prior to start of work.

1. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.

2. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations (i.e.: Work by others on behalf of the Owner, normal work of Owner's personnel and other building occupants, etc.).

B. Photographic Survey: Submit photographs taken of existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with Owner's Representative prior to start of work, with copy to the Architect.

1.4 PERFORMANCE REQUIREMENTS:

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

1.5 JOB CONDITIONS:

A. Occupancy: Owner will occupy portions of the building or site immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's operations. Provide minimum of 72 hours advance notice to Owner of demolition activities that will affect Owner's operations.

B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished. Conditions existing at time of inspection for bidding purposes will be maintained by Owner insofar as practicable. However, minor variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

D. Partial Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor may be removed from structure as work progresses.

1. Transport salvaged items from site as they are removed.
2. Storage or sale of removed items on site *will not be permitted*.

E. Protections: Provide temporary barricades and other forms of protection to protect Contractor's and Owner's personnel and general public from injury due to selective demolition work.

1. Provide protective measures as required to provide free and safe passage of Owner's personnel and representatives to portions of building and/or site, as required.
2. Erect temporary covered passageways if required by authorities having jurisdiction.

3. Provide interior bracing or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities or work to remain.
4. Protect from damage existing finish work that is to remain in place and which becomes exposed during demolition operations.
5. Protect floors with suitable coverings when necessary.
6. Construct temporary insulated dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks. Temporary exterior partitions shall be weatherproof.
7. Remove protections at completion of work.

F. Damages: Promptly repair damages caused to adjacent facilities by demolition work.

G. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, building egress, and other adjacent occupied or used facilities.

1. Do not close, block, or otherwise obstruct streets, walks, exit egress from building, or other occupied or used facilities without written permission from authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

H. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.

I. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.

1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
2. Maintain fire protection services during selective demolition operations.

J. Environmental Controls: Use temporary enclosures and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations. Perform additional surveys as the Work progresses to detect hazards resulting from selective demolition activities.

D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video.

1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PREPARATION:

A. General: Provide interior bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain.

1. Cease operations and notify Owner's Representative immediately if safety of structure appears to be endangered.
2. Take precautions to support structure until determination is made for continuing operations.

B. Erect and maintain dust-proof partitions and closures, as required to prevent spread of dust or fumes to occupied portions of the building. Temporary partitions in exterior openings shall be weatherproof.

C. Locate, identify, stub off, and disconnect utility services that are not indicated to remain.

1. Provide bypass connections as necessary to maintain continuity of service to occupied areas of building.
2. Provide minimum of 72-hours advance notice to Owner if shutdown of service is necessary during changeover.

3.3 PROTECTION:

A. Temporary Protection: Provide temporary barricades and other protection required to

prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, equipment, and fixtures from soilage or damage when demolition work is performed in areas where such items have not been removed.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished. Strengthen or add new supports when required during progress of selective demolition.

C. Remove temporary barricades and protections where hazards no longer exist.

3.4 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS:

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Arrange to shut off utilities with utility companies.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
    c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.5 DEMOLITION:

A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.

1. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
2. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.
3. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

B. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Owner's Representative in written, accurate detail. Pending receipt of directive from Owner's Representative, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

3.6 SALVAGED MATERIALS:

A. Salvaged Items: Where indicated on Drawings as "Salvage - Deliver to Owner," or similar indication, carefully remove indicated items, clean, store, and turn over to Owner and obtain receipt.

1. Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance, remain property of Owner. Notify Owner's Representative if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.
2. Carefully remove, clean, and deliver to Owner items so on the Drawings.

3.7 DISPOSAL OF DEMOLISHED MATERIALS:

A. Remove from building site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose of off site.

1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
2. Burning of removed materials is not permitted on project site.

3.8 CLEANUP AND REPAIR:

A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean; vacuum carpets.

1. Repair demolition performed in excess of that required.
2. Return elements of construction and surfaces to remain to condition existing prior to start operations.
3. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SELECTIVE DEMOLITION

SECTION 042000

UNIT MASONRY

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. This Section includes unit masonry assemblies consisting of the following:

1. Concrete masonry units (CMUs).
2. Mortar and grout.
3. Reinforcing steel.
4. Masonry joint reinforcement.
5. Miscellaneous masonry accessories.

B. Related Sections include the following:

1. Division 7 Section - "Joint Sealants."
2. Divison 9 Section – "Painting."

C. Products installed, but not furnished, under this Section include the following:

1. Steel lintels for unit masonry indicated on Drawings.
2. Hollow metal frames to be built into masonry walls as specified in Division 8 Section "Hollow Metal Doors and Frames."

1.3 DEFINITIONS:

A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PERFORMANCE REQUIREMENTS:

A. Compressive Strength of Masonry: Provide unit masonry that develops net-area compressive strengths (f'm) at 28 days of not less than 2000 psi. Determine compressive strength of masonry from net-area compressive strengths of masonry units and mortar types according to Table 2 in ACI 530.1/ASCE 6/TMS 602.

1.5 SUBMITTALS:

A. Product Data: Submit manufacturer’s product literature and technical data for items listed as follows:

1. Manufactured mortars, cements and admixtures. Include mixing and installation instructions.

2. Masonry joint reinforcement and accessories.

B. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:

1. Masonry units: Include data on material properties and material test reports substantiating compliance with requirements. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
2. Cementitious Materials: Include brand, type, and name of manufacturer.
3. Grout Mixes: Include description of type and proportions of ingredients.
4. Reinforcing bars: Provide for each type and size.
5. Joint reinforcement: Provide for each type and size.

C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to Tables 2 in ACI 530.1/ASCE 6/TMS 602.

E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements. Submit only when conditions are required to meet construction schedule as authorized by Architect.

1.6 QUALITY ASSURANCE:

A. Source Limitations:

1. Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
2. Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate. For each type cement specified, only one brand shall be used throughout the project.

1.7 DELIVERY, STORAGE, AND HANDLING:

A. Deliver reinforcement and accessories in bundles or boxes with waterproof tags. Maintain tags attached until material is incorporated into the work.

B. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

C. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

D. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp or wet.

E. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

1.8 PROJECT CONDITIONS:

A. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

B. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions.

1. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
2. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried, but not less than seven (7) days after completing cleaning.

C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 PRODUCTS

2.1 MASONRY UNITS, GENERAL:

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not uses units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

2.2 CONCRETE MASONRY UNITS (CMUS):

A. Concrete Masonry Units: ASTM C90, hollow and solid units.

1. Weight Classification: Normal weight.
2. Net Area Compressive Strength: 2000 psi minimum average.
3. Nominal Face Dimensions: 8-inches by 16-inches, unless otherwise indicated on drawings.
4. Thickness: As indicated on drawings.
5. Exposed Faces: Provide units with uniform color and texture.

B. Shapes: Provide shapes indicated and as follows:

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
2. Provide bullnose units for external corners located in interior of building, unless otherwise indicated.

C. Concrete Building Brick: Meeting ASTM C 55**,** Grade N.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength 3500 psi.
2. Weight Classification: Medium or Normal weight.
3. Size (Actual Dimensions): 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.

2.3 MASONRY LINTELS:

A. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam concrete masonry units with reinforcing bars placed as indicated and filled with coarse grout. Temporarily support built-in-place lintels until cured.

2.4 MORTAR AND GROUT MATERIALS:

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Masonry Cement: ASTM C 91, non-staining, 18-percent maximum air content by volume and proportioned to comply with requirements of ASTM C270 for Type "S" mortar.

D. Aggregate for Mortar: ASTM C 144; for mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone. Provide aggregate from a single source for colored mortar.

E. Aggregate for Grout: ASTM C 404; aggregate sizes as specified for indicated grout types.

1. Fine Grout: Size no. 1 fine aggregate.
2. Coarse Grout: Size no. 8 coarse aggregate, limited to use when minimum horizontal dimensions of grouting space exceeds 4-inches.

F. Cold-Weather Admixture:

1. Acceptable Products subject to compliance with specified requirements:
   a. Euclid Chemical Company (The); Accelguard 80.
   b. Grace Construction Products, a unit of W. R. Grace & Co.; Morset.
   c. BASF Construction Chemicals, LLC; Trimix-NCA.
2. Type: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

G. Water: Clean, Potable, free from deleterious amounts of alkalies, acids and organic materials.

2.5 REINFORCING STEEL AND BAR POSITIONERS:

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.

B. Vertical Bar Positioners:

1. Acceptable Products:
   a. Heckmann Building Products Inc.; No. 376 Rebar Positioner.
   b. Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
   c. Wirebond / Masonry Reinforcing Corp. of America; Figure 8 Single or Figure 8 Double Rebar Positioner.
2. Characteristics: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells.
   a. Material: Fabricated from 0.148-inch (9-gauge) diameter steel wire.
   b. Configuration: Provide units with either two loops or four loops as needed for number of bars indicated.
   c. Finish: Hot-dipped galvanized, meeting ASTM A153, Class B-2.

C. Horizontal Bar Positioners:

1. Acceptable Products:
   a. Heckmann Building Products, Inc.; No. 379.
   b. Wirebond / Masonry Reinforcing Corp. of America; Bond Beam Positioner.
2. Characteristics: Wire units designed to hold horizontal rebar in position in cells of concrete masonry bond beam or lintel units.
   a. Material: Fabricated from 0.148-inch (9-gauge) diameter steel wire.

b. Finish: Hot-dipped galvanized, meeting ASTM A153, Class B-2.

2.6 MASONRY HORIZONTAL JOINT REINFORCEMENT:

A. Acceptable Manufacturers, subject to compliance with specified requirements:

1. Heckmann Building Products, Inc.
2. Hohmann and Barnard, Inc.
3. Wirebond / Masonry Reinforcing Corp. of America.

B. Characteristics: Masonry joint reinforcement meeting ASTM A951; types as specified.

1. Types: Ladder type.
2. Material: Fabricated from cold-drawn steel wire meeting ASTM A82.
   a. Longitudinal Rods: 9 gauge (W1.7 or 0.148-inch) diameter galvanized deformed rods.
   b. Cross Rods: 9 gauge (W1.7 or 0.148-inch) diameter galvanized rods spaced at maximum 16-inches on center and welded to longitudinal rods.
3. Sizes: Width of reinforcement shall be 2-inches less than nominal wall thickness, allowing longitudinal rods to be positioned on shell wall of units.
4. Lengths: Provide reinforcement in minimum 10 feet (3m) lengths.
5. Corners and Tees: Provide prefabricated corners and tees of same design and finish as joint reinforcement for intersecting walls.
6. Finishes:
   a. Reinforcement fully embedded in mortar at single wythe interior masonry: Galvanized, meeting ASTM A641, Class 3.
   b. Reinforcement at single wythe exterior masonry: Hot-dipped galvanized, meeting ASTM A153, Class B-2.

2.7 MISCELLANEOUS MASONRY ACCESSORIES:

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35-percent; of width and thickness indicated; formulated from neoprene urethane or PVC.

B. Wire Mesh Hardware Cloth: 1/2-inch by 16-gauge galvanized steel mesh, 2-inches less than wall width; length as required.

C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

2.8 MASONRY CLEANERS:

A. Acceptable Manufacturers; subject to compliance to specified requirements:

1. Diedrich Technologies, Inc.
2. EaCo Chem, Inc.
3. ProSoCo, Inc.

B. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces.

1. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
2. Masonry cleaning compound shall be acceptable to brick masonry unit manufacturer and as recommended for specified materials.

2.9 MORTAR AND GROUT MIXES:

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Use masonry cement mortar unless otherwise indicated.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide mortar portioned as specified.

1. Masonry Cement Mortar: One part Type 'S' masonry cement to aggregate proportioned not less than 2¼ nor more than three times the volume of masonry cement used to produce Type 'S' mortar.
2. Cement-Lime Mortar: One part Portland cement and ¼ to ½ parts hydrated lime to aggregate proportioned at no less than 2¼ nor more than three times the combined volume of cement and lime used to produce Type 'S' mortar.

C. Mortar Placement Requirements:

1. For interior non-load bearing concrete masonry unit walls: Type 'S', natural color.
2. For vertically reinforced masonry, including interior and exterior load-bearing walls: Type 'S', natural color.

D. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type (coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 EXECUTION

3.1 EXAMINATION:

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL:

A. Thickness: Build walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

3.3 CONSTRUCTION TOLERANCES:

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2-inch or minus 1/4-inch.
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2-inch.
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4-inch in a story height or 1/2-inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4-inch in 10 feet, or 1/2-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8-inch in 10 feet, 1/4-inch in 20 feet, or 1/2-inch maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4-inch in 10 feet, 3/8-inch in 20 feet, or 1/2-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8-inch in 10 feet, 1/4-inch in 20 feet, or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4-inch in 10 feet, 3/8-inch in 20 feet, or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4-inch in 10 feet, or 1/2-inch maximum.

7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16-inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8-inch, with a maximum thickness limited to 1/2-inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8-inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8-inch or minus 1/4-inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8-inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8-inch.

3.4 LAYING MASONRY WALLS:

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Patterns:

1. For Exposed Concrete Masonry Units: Lay exposed masonry in one-half running bond pattern with vertical joint in each course centered on units in courses above and below. Do not use units with less than nominal 8-inch horizontal face dimensions at corners or jambs.
2. Concealed Masonry: Lay masonry with all units in a wythe in running bond or bonded by lapping not less than 4-inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 8-inch horizontal face dimensions at corners or jambs.

C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

E. Fill space between non-rated hollow-metal frames and masonry solidly with mortar, unless otherwise indicated.

F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

G. Fill cores in hollow concrete masonry units with grout 24-inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

H. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. Stop filler 1/2-inch from face of masonry for caulking with sealant specified in the Division 7 Section "Joint Sealants".

3.5 MORTAR BEDDING AND JOINTING:

A. Lay concrete masonry units (CMUs) as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

D. Cut joints flush for masonry walls to receive fluid-applied membranes, plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.6 MASONRY HORIZONTAL JOINT REINFORCEMENT:

A. Install joint reinforcement continuously for entire length of wall with longitudinal side rods embedded in mortar with a minimum cover of 5/8-inch on exterior side of walls, 1/2-inch elsewhere.

1. Space reinforcement not more than 16-inches on center, unless otherwise specified.
2. Space reinforcement not more than 8-inches on center in foundation walls and parapet walls.
3. Lap reinforcement a minimum of 6-inches.
4. At splices, cross rods may be removed to facilitate placement.
5. Install joint reinforcement with cross rods located so as not to obstruct cells at areas to receive vertical reinforcement bars.
6. Install additional joint reinforcement not more than 8-inches above and below wall openings and extending 24-inches beyond jamb of openings, each side.

B. Interrupt joint reinforcement at control and expansion joints. Stop reinforcement 1-inch back from expansion and control joints and openings in masonry walls.

C. Provide continuity at wall intersections and corners by using prefabricated T or L-shaped units. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, pipe enclosures, and other special conditions.

3.7 LINTELS

A. Masonry Lintels: Install masonry lintels where shown and where openings of more than 8-inches for block-size units are shown without structural steel or other supporting lintels.

1. Construct built-in-place masonry lintels using specially formed bond beam units with reinforcing bars placed as indicated and filled with coarse grout. Temporarily support built-in-place lintels until cured.
2. See structural drawings for lintel reinforcing.

B. Steel Lintels: Install steel lintels where indicated.

C. Provide minimum bearing of 8-inches at each jamb, unless otherwise indicated.

3.8 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 60-inches.

3.9 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed concrete unit masonry if required.

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall area at location as directed by Architect. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing the surfaces thoroughly with clear water.
5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

END OF UNIT MASONRY

SECTION 07 84 00

FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.
   2. Fire-resistive joint systems.

1.3 PERFORMANCE REQUIREMENTS

A. General:
   1. For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.
   2. Provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assembly in which fire-resistive joint systems are installed.

B. Through-Penetration Firestop System Ratings: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814 or UL 1479:
   1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.
   2. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:
      a. Penetrations located outside wall cavities.
      b. Penetrations located outside fire-resistance-rated shaft enclosures.

C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.
   1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.

2. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

D. Joint Systems in and between Fire-Resistance-Rated Constructions: Provide systems with assembly ratings equaling or exceeding the fire-resistance ratings of construction that they join, with movement capabilities and L-ratings as determined by UL 2079 and complying with requirements of governing building code referenced.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For each through-penetration firestop system and fire-resistive joint system.
1. Show each type of construction condition penetrated and which joints are installed, relationships to adjoining construction, and type of penetrating item.
2. Include through-penetration firestop and fire-resistive joint system design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.
3. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system and fire-resistive joint system configuration for construction and penetrating items.
4. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular through-penetration firestop or fire-resistive joint condition, submit illustration, with modifications marked, approved by through-penetration firestop system or fire-resistive joint system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

C. Through-Penetration Firestop System and Fire-Resistive Joint System Schedule: Indicate locations of each through-penetration firestop system and fire-resistive joint system, along with the following information:
1. Types of penetrating items.
2. Types of joints to be installed to fire-rated construction.
3. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
4. Types of constructions where joints to be protected occur.
5. Through-penetration firestop systems and fire-resistive joint system for each location identified by assembly design designation of qualified testing and inspecting agency.

D. Qualification Data: For installer to demonstrate their capabilities and experience; include documentation indicating compliance with specified qualification requirements. Submit for Architect's information only.

E. Product Test Reports: From a qualified testing agency indicating through-penetration firestop system and fire-resistive joint system complies with requirements, based on comprehensive testing of current products. Submit for Architect's information only.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm experienced in installing through-penetration firestop systems and fire-resistive joint systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance.
   1. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements.
   2. Manufacturer's willingness to sell its through-penetration firestop system and fire-resistive joint system products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.

B. Regulatory Requirements: : Comply with requirements of the International Building Code, 2012 edition for firestopping penetrations and for fire-resistant joint protection.

C. Fire-Test-Response Characteristics: Provide through-penetration firestop systems and fire-resistive joint systems that comply with the following requirements and those specified in this section:
   1. Firestopping systems and fire resistive joint systems tests are performed by a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
   2. Through-penetration firestop systems and fire-resistive joint systems are identical to those tested per referenced testing standard. Provide rated systems complying with the following requirements:
      a. Through-penetration firestop system and fire-resistive joint system products shall bear classification marking of qualified testing and inspecting agency.
      b. Through-penetration firestop systems and fire-resistive joint systems shall correspond to those indicated by reference to through-penetration firestop system and fire-resistive joint system designations listed of the qualified testing and inspecting agency.
      c. Classification markings on penetration firestopping systems and fire-resistive joint systems shall correspond to designations listed by the following:
         1) UL in its "Fire Resistance Directory."
         2) Intertek Group, plc in its "Building Products Directory."
         3) FM Global in its "Building Materials Approval Guide."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver through-penetration firestop system and fire-resistive joint systems products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install through-penetration firestop systems and fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Ventilate through-penetration firestop systems and fire-resistive joint systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

A. Coordinate construction of openings, joints and penetrating items to ensure that through-penetration firestop systems and fire-resistive joint systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems. Coordinate sizing of joints to accommodate fire-resistive joint systems.

C. Do not cover up through-penetration firestop system and fire-resistive joint systems installations that will become concealed behind other construction until each installation has been examined by building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers; subject to compliance with requirements:
1. A/D Fire Protection Systems Inc.
2. W. R. Grace & Co. - Conn.
3. Hilti, Inc.
4. Johns Manville.
5. Nelson Firestop Products.
6. RectorSeal Corporation.
7. Specified Technologies Inc.
8. 3M; Fire Protection Products Division.
9. Tremco, Inc.; Sealant/Weatherproofing Division.
10. USG Corporation.

2.2 THROUGH-PENETRATION FIRESTOP SYSTEMS

A. Through-Penetration Firestop Systems: Field-constructed firestopping for penetrations through fire-rated walls composed of materials and accessories assembled in accord with Through-Penetration Firestopping System designs meeting specified performance requirements.

B. Firestop Devices: Factory-assembled, self-contained firestopping devices for penetrations through fire-rated walls meeting specified through-penetration firestop system performance requirements.
   1. Cast-in-Place Devices: Designed for use in cast-in-place concrete and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
   2. Collar Devices: Collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

C. Compatibility: Provide through-penetration firestop systems and devices that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

D. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated. Accessories include the following items:
   1. Permanent forming/damming/backing materials, including the following:
      a. Slag-/rock-wool-fiber insulation.
      b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
      c. Fire-rated form board.
      d. Fillers for sealants.
   2. Temporary forming materials.
   3. Substrate primers.
   4. Collars.
   5. Steel sleeves.

2.3 FIRE-RESISTIVE JOINT SYSTEMS

A. Fire-Resistive Joint Systems: Fire-resistant joint construction designed to prevent the spread of fire through wall assemblies composed of materials and accessories assembled in accord with joint system designs meeting specified performance requirements.
   1. Fire-resistive joint systems used in construction other than masonry, precast or concrete wall construction may be of any product of the manufacturers specified complying with specification requirements.
   2. Fire-resistive joints systems used in masonry, precast concrete and cast-in-place concrete wall construction shall be limited only to systems using sealant products specified in the article of this specification section indicated for such use.

B. Compatibility: Provide fire-resistive joint systems that are compatible with joint substrates, under conditions of service and application, as demonstrated by fire-resistive joint system manufacturer based on testing and field experience.

C. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install fill materials and to comply with specified

performance requirements. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing and inspecting agency for systems indicated.

2.4 FILL MATERIALS

A. General: Provide through-penetration firestop systems and fire-resistive joint systems containing the types of fill materials indicated in the Through-Penetration Firestop System and Fire-Resistive Joint System designs. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.

B. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

C. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.

D. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

E. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

F. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

G. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.

H. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

I. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
   1. Grade: Pourable (self-leveling) formulation for openings in horizontal surfaces, and nonsag formulation for openings in vertical and other surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.
   2. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in horizontal surfaces.
   3. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

2.5 MIXING

A. For those products requiring mixing before application, comply with through-penetration firestop system and fire-resistive joint systems manufacturer's written instructions for

accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, joint configurations, penetrating items, substrates, and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Clean out openings and joints immediately before installing through-penetration firestop systems or fire-resistive joint systems to comply with system manufacturer's written instructions and with the following requirements:
   1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
   2. Clean opening and joint substrates including penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping and joint system materials. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by through-penetration firestop system and fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent through-penetration firestop systems or fire-resistive joint systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestopping or joint system's seal with substrates.

3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

A. General: Install through-penetration firestop systems to comply with specified performance requirements and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated. After installing fill

materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for firestop systems by proven techniques to produce the following results:
   1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
   2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
   3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIRE-RESISTIVE JOINT SYSTEM INSTALLATION

A. General: Install fire-resistive joint systems to comply with specified performance requirements and fire-resistive joint system manufacturer's written installation instructions for products and applications indicated.

B. Install forming/packing/backing materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

C. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:
   1. Fill voids and cavities formed by openings and forming/packing/backing materials as required to achieve fire-resistance ratings indicated.
   2. Apply fill materials so they contact and adhere to substrates formed by joints.
   3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.5 IDENTIFICATION

A. Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6-inches of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems.
   1. Use mechanical fasteners for metal labels.
   2. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted.
   3. Include the following information on labels:
      a. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
      b. Contractor's name, address, and phone number.
      c. Through-penetration firestop system designation of applicable testing and inspecting agency.
      d. Date of installation.
      e. Through-penetration firestop system manufacturer's name.
      f. Installer's name.

B. Identify fire-resistive joint systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6-inches of joint edge so labels will be visible to anyone seeking to remove or penetrate joint system.
   1. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed.
   2. Include the following information on labels:
      a. The words "Warning - Fire-Resistive Joint System - Do Not Disturb. Notify Building Management of Any Damage."
      b. Contractor's name, address, and phone number.
      c. Designation of applicable testing agency.
      d. Date of installation.
      e. Manufacturer's name.
      f. Installer's name.

3.6 CLEANING AND PROTECTING

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems and fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping and joint systems immediately and install new materials to produce systems complying with specified requirements.

END OF FIRESTOPPING

SECTION 079200

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. One-part polyurethane sealant.
2. Traffic grade polyurethane sealant.
3. Mildew resistant silicone sealants.
4. Acrylic-latex caulking compound.

B. Related Section:

1. Division 4 section – "Unit Masonry."
2. Division 7 Section – "Firestopping."
3. Division 9 Section – "Gypsum Board Assemblies."
4. Division 9 Section – "Tiling."
5. Division 9 Section – "Painting."

1.2 DEFINITIONS

A. Sealant: A weatherproof elastomer used in filling and sealing joints, having properties of adhesion, cohesion, extensibility under tension, compressibility and recovery; designed to make joints air and watertight. Material is designed generally for application in exterior joints and for joints subject to movement.

B. Caulking Compound: A material used in filling joints and seams, having properties of adhesion and cohesion; not required to have extensibility and recovery properties, generally for application in interior joints.

C. Caulk: The process of filling joints, without regard to type of material.

D. Joint Failure: A caulked joint exhibiting one or more of the characteristics listed below.

1. Air and/or water leakage.
2. Migration.
3. Loss of adhesion.
4. Loss of cohesion.
5. Failure to cure.
6. Discoloration.
7. Staining of adjacent work.
8. Development of bubbles, air pockets or voids.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product literature, indicating conformance with specified requirements. Include installation instructions for each type sealant. Indicate preparation requirements for each substrate condition.

B. Color Samples: Submit samples for each type sealant specified. Samples shall be actual materials. Architect reserves the right to reject work not in conformance with selected colors, based upon samples submitted.

1.4 QUALITY ASSURANCE

A. Single Source Requirements: Each type joint sealant used throughout the Project shall be the product of a single manufacturer.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to job site in manufacturer's original packaging.

B. Store materials in accordance with manufacturer's instructions complying with environmental conditions and recommended temperature ranges.

1.6 PROJECT CONDITIONS

A. Environmental Requirements:

1. Install no materials under adverse weather conditions, or when temperatures are below or above those recommended by manufacturer's product data, or when substrate moisture content is above recommended levels.
2. Proceed with work only when forecasted weather conditions are favorable for joint cure and development of high early bond strength.
3. Wherever joint width is affected by ambient temperature variations, install materials only when temperatures are in lower third of manufacturer's recommended installation temperature range.
4. Do not install sealant materials when substrate temperature is below 40 degrees F.

B. Protection of Adjacent Surfaces:

1. Protect by applying masking material or manipulating application equipment to keep materials in joint. if masking materials are used, allow no tape to touch cleaned surfaces to receive sealant. Remove tape immediately after caulking, before surface skin begins to form.
2. Remove misapplied materials from surfaces using solvents and methods recommended by manufacturer.
3. Restore surfaces from which materials have been removed to original condition and appearance.

1.7 WARRANTY

A. Warrant work to be free from defects in materials and workmanship, including joint failure, for a period of Two (2) years, beginning at Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ONE-PART POLYURETHANE SEALANT:

A. Acceptable Products; subject to compliance with specified requirements:

1. BASF Corporation; MasterSeal NP1.
2. Pecora Corp., Dynatrol™ I-XL
3. Sika Corporation; Sikaflex-1a
4. Tremco, Inc., Dymonic 100.

B. Characteristics:

1. Type: One-part, non-sag, elastomeric polyurethane sealant meeting ASTM C920, Type S, Grade NS, Class 25; compatible for painting.
2. Color: As selected by the Architect from Manufacturer's standard selection for compatibility with paint colors used.

2.2 TRAFFIC GRADE POLYURETHANE SEALANT:

A. Acceptable Products; subject to compliance with specified requirements:

1. BASF Corporation; MasterSeal SL-1 or SL-2.
2. Pecora Corp., Urexpan NR 200.
3. Sika Corporation; Sikaflex-2c SL.
4. Tremco, Inc.; Vulkem 45SSL or THC-901.

B. Characteristics:

1. Type: Single or multi-component, polyurethane sealant formulated for horizontal traffic bearing surfaces, meeting ASTM C920, Type S or M, Grade P or NS, Class 25; self-leveling for flat surfaces and non-sag for sloped surfaces.
2. Color: As selected by the Architect from Manufacturer's standard selection.

2.3 MILDEW RESISTANT SILICONE SEALANT:

A. Acceptable Products; subject to compliance with specified requirements:

1. Dow Corning Corp.; 786 Mildew-Resistant Silicone Sealant.
2. Momentive Performance Materials, Inc. (GE); SCS 1700 Sanitary Silicone Sealant.
3. Pecora Corp.; 898NST Sanitary Mildew Resistant Silicone Sealant.
4. BASF Corporation; Omniplus.

B. Characteristics:

1. Type: One part silicone rubber; mildew and stain resistant meeting ASTM C 920, Type S, Grade NS; USDA or FDA approved.
2. Color: White.

2.4 ACRYLIC-LATEX CAULKING COMPOUND:

A. Acceptable Products; subject to compliance with specified requirements:

1. C.R. Laurence Company, Inc.; CRL 321.
2. DAP, Inc.; Alex Plus
3. Momentive Performance Materials, Inc.; GE Max 2500 Caulk.
4. Pecora Corp.; AC-20 +Silicone.
5. Tremco, Inc.; Tremflex 834.

B. Characteristics: One-part, flexible, non-sag, non-staining, non-bleeding, paintable, siliconized acrylic-latex emulsion compound meeting ASTM C 834, Type OP, Grade NF or better.

2.5 ACCESSORY MATERIALS:

A. Joint Cleaner: Type recommended by material manufacturer for substrates indicated.

B. Joint Primer/Sealer: Type recommended by material manufacturer for conditions, exposures and substrates indicated.

C. Bond Breaker Tape: Plastic tape applied to contact surfaces where bond to substrate or joint filler must be avoided for material performance.

D. Sealant Backer Rod: Compressible rod stock polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam or neoprene foam as recommended by material manufacturer for compatibility with sealant. Provide size and shape or rod to control joint depth, break bond at bottom of joint, form optimum shape of bead on back side and minimize possibility of extrusion when joint is compressed.

E. Tooling Agent: Agent recommended by the material manufacturer to insure contact of material with inner joint faces.

F. Divider Strips: Synthetic rubber or closed cell synthetic foam not less than 1/16-inch thickness and full depth of sealant or caulking compound; approved by manufacturers of dissimilar materials as being compatible with each other.

PART 3 - EXECUTION

3.1 JOINT SURFACE PREPARATION:

A. Clean joint surfaces immediately before caulking joints. Remove dirt, insecure coatings, moisture and other substances which would interfere with bond.

B. Etch concrete and masonry joint surfaces to remove excess alkalinity, unless material manufacturer's product data indicates alkalinity does not interfere with bond and performance. Etch with 5% solution of muriatic acid; neutralize with dilute ammonia solution; rinse with clean water and allow to dry before caulking.

3.2 APPLICATION

A. Comply with sealant and caulking materials manufacturer's product data, except where more stringent requirements are specified.

B. Prime or seal joint surfaces where recommended by material manufacturer. Do not allow primer/sealer to spill or migrate onto adjacent surfaces.

C. Install backer rod for all sealant and caulking materials, except where recommended to be omitted by the material manufacturer for application indicated. Place backer rod to maintain recommended sealant thickness and profiles. Substitute bond breaker tape for shallow, closed joints.

D. Employ installation techniques which will ensure that materials are deposited in uniform, continuous ribbons without gaps or air pockets, with complete wetting of joint bond surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form slight cove, so that joint will not trap moisture and debris.

E. Do not allow materials to overflow or spill onto adjacent surfaces. Use masking tape or other methods to prevent staining of adjacent surfaces.

F. Remove excess and misplaced materials as work progresses. Clean adjoining surfaces to eliminate evidence of misplaced materials, without damage to adjacent surfaces or finishes.

G. Tool joints of non-sag sealants to concave profile with smooth uniform surface, flush with edges of substrate. Maintain sealant depth-to-width ratio in accordance with manufacturer's product data.

H. Cure sealants and caulking compounds in accordance with manufacturer's product data to obtain high early bond strength, internal cohesive strength and surface durability. Protect uncured surfaces from contamination and physical damage.

3.3 SEALANTS AND CAULKING SCHEDULE

A. Interior masonry control joints: One-Part Polyurethane Sealant.

B. Interior horizontal (traffic-bearing) joints in concrete floor slabs; including control joints: Traffic Grade Polyurethane Sealant.

C. Typical interior joints and seams at abutting and adjacent materials: Acrylic-Latex Caulking Compound.

D. Interior joints in conjunction with vanities, plumbing fixtures and toilet room finishes: Mildew Resistant Silicone Sealant.

END OF JOINT SEALANTS

SECTION 081213

HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. Section Includes: Hollow metal doors and frames.

B. Related work specified elsewhere includes:
1. Division 6 Section – "Rough Carpentry"
2. Division 8 Section – "Flush Wood Doors."
3. Division 8 Section – "Door Hardware"
4. Division 9 Section – "Gypsum Board Assemblies"
5. Division 9 Section – "Painting"

1.3 QUALITY ASSURANCE:

A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications: Standard Steel Doors and Frames" (SDI-100) and as herein specified.

B. Performance Requirements:
1. Physical Endurance: Comply with performance requirements for specified level and model classification in accordance with ANSI/SDI-A250.8-2014 (SDI-100) and ANSI/SDI-A250.4-2011 for frames, frame anchors and hardware reinforcing.
2. Finish: Comply with the standard performance criteria of ANSI A250.10-2011 for primed steel surfaces.

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 based on testing at positive pressure according to NFPA 252 or UL 10C for fire-protection ratings indicated.
1. Smoke and Draft Control: Fire rated door assemblies shall be listed and labeled for smoke and draft control by Underwriters Laboratories (UL), Intertek Warnock Hersey (WHI), or another qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.
2. Fire Labels: Fire-rated assemblies shall be labeled and listed by Underwriters Laboratories (UL), Intertek Warnock Hersey (WHI), or another testing and inspecting agency acceptable to authorities having jurisdiction.

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's technical product data substantiating that products comply with requirements.

B. Shop Drawings: Submit for fabrication and installation of steel frames.
   1. Include details of each frame type, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections.
   2. Show anchorage and accessory items.
   3. Provide schedule of frames using same reference numbers for details and openings as those on contract drawings.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Deliver hollow metal work cartoned or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided finish items are equivalent in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.

D. Store frames at building site under cover. Place units on minimum 4-inch-high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturers; Subject to compliance with requirements, provide hollow metal frames by one of the following:
   1. Ceco Door Products; an Assa Abloy Group company.
   2. Curries Company; an Assa Abloy Group company.
   3. Habersham Metal Products Company
   4. Mesker Door Inc.
   5. Pioneer Industries, Inc..
   6. Republic Doors and Frames.
   7. Steelcraft / Allegion, plc .

2.2 MATERIALS:

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), Coating Designation 04Z; mill phosphatized.

D. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanize items to be built into exterior walls, complying with ASTM A 153, Class C or D as applicable.

E. Galvanizing Repair Paint: High zinc dust content paint for repair of galvanized surfaces damaged by fabrication or welding, complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

F. Shop Applied Primer: Rust-inhibitive enamel or paint, either air drying or baking, suitable as a base for specified finish paints.

2.3 INTERIOR HOLLOW METAL FRAMES:

A. Frame Profile: All frames shall be of double rabbeted profile; except where single-rabbeted frames are specifically indicated on the Drawings.

B. Frame Classification: Level III (Extra Heavy Duty) per ANSI/SDI A250.8.

C. Frame Construction: Welded frames fabricated from minimum 16-gauge (0.053-inch) specified steel sheet material.

1. Corners: Mitered or coped and full profile welded. Welds shall be dressed and ground smooth with no visible seams.

2. Temporary Spreaders: Provide with removable temporary spreader bars welded to bottom of each jamb and maintain in place during shipping, storage and handling.

3. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames. Reinforcement shall be provided for strikes, closers and brackets, and other surface applied hardware for field drilling and tapping.

D. Plaster Guards: Provide 26-gauge steel plaster guards or mortar boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation.

E. Frame Anchors: Fabricated from not less than 18-gauge (0.042-inch) specified steel sheet for interior frames.

1. Floor anchors: Clip type with 5/16-inch holes holes provided to receive two fasteners per jamb; welded to inside of each jamb at frame bottom for securing to floor substrate.
2. Jamb Anchors: Provide anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.

a. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 18-gauge (0.042 inch) thickness, with corrugated or perforated straps not less than 2-inches wide by 10-inches length; or wire anchors not less than 3/16-inch (0.187-inch) diameter.

b. Stud-Wall Type Jamb Anchors: Designed to engage stud, welded to back of frames; not less than 18-gauge (0.042-inch) thickness.

c. Jamb Anchors for Frame Installation to In-Place Masonry: Post-installed expansion anchor assembly consisting of minimum 3/8-inch diameter countersunk, flat head, stove bolts with expansion shields, spaced 6-inch maximum from top and bottom of frame and 24-inches (2-ft) on center , maximum in between. Provide with 16-gauge steel shield and sleeve spacers at each bolt, fitted inside frames.

d. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24-inches of frame height above 7-feet.

F. Setting Bars: Furnish welded frames with setting bars for installation use.

2.4 FABRICATION:

A. Fabricate hollow metal frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at project site.

B. Fabricate frames, concealed stiffeners, reinforcement, edge channels, from either cold-rolled or hot-rolled steel (at fabricator's option).
1. Fabricate frames in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.
2. Frames shall be formed by press brake with corners sharp and true.
3. Corners shall be mitered and accurately fitted, and shall be fully electrically welded and then ground smooth.

C. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.

D. Finish Hardware Preparation:
1. Prepare frames to receive mortise and concealed finish hardware in accordance with final Finish Hardware Schedule and templates provided by hardware supplier.
2. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
3. Reinforce frames to receive surface applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site.
4. Frames shall be accurately mortised for hardware.
5. Locate finish hardware as indicated on final shop drawings, or if not indicated, in accordance with "Recommended Locations for Builders' Hardware," published by Door and Hardware Institute.

E. Shop Painting:
1. Clean, treat and paint exposed surfaces of metal frame units, including galvanized surfaces.

2. Clean steel surfaces of mill scale, rust, oil, grease, dirt and other foreign materials before application of paint.
3. Use galvanizing repair paint for galvanized surfaces damaged by fabrication or welding, prior to prime coat.
4. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

B. Fabrication Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Install hollow metal frames and accessories in accordance with final reviewed shop drawings and manufacturer's data, and as herein specified.

B. Placing Frames:
1. Comply with provisions of ANSI/SDI A250.11 "Recommended Erection Instructions for Steel Frames," unless otherwise indicated.
2. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. Remove temporary braces and spreaders leaving surfaces smooth and undamaged.
3. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
4. Pack mineral-fiber insulation solid behind frames in metal-stud partitions.
5. In masonry construction, locate a minimum of 3 wall anchors per jamb at hinge and strike levels. Add one (1) wall anchor per jamb at hinge and strike levels for each whole 1'-10" height increment over 6'-0"; similar at glazed and cased openings.
6. At in-place concrete or masonry construction, set frames and secure to adjacent construction with machine screws and masonry anchorage devices.
7. Field apply bituminous coating to backs of frames that will be filled with grout containing anti-freezing agents.

C. Install frames to fire-rated openings according to requirements of NFPA 80.

D. Install silencers, weatherstrip gasketing and surface mounted hardware items after all painting of frames have been completed.

3.2 INSTALLATION TOLERANCES:

A. Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
1. Squareness: Plus or minus 1/16-inch, measured at door rabbet on a line 90-degrees from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16-inch, measured at jambs on a horizontal line parallel to plane of wall.

3. Twist: Plus or minus 1/16-inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16-inch, measured at jambs at floor.

3.3 ADJUST AND CLEAN:

B. Prime Coat Touch-up:
1. Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
2. Use galvanizing repair paint for galvanized surfaces, prior to prime coat.

C. Final Adjustments: Check and readjust operating finish hardware items, leaving hollow metal frames undamaged and in sound condition for hanging doors.

END OF HOLLOW METAL FRAMES

SECTION 081416
FLUSH WOOD DOORS

PART 1 - GENERAL

1.1. RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2. SUMMARY:

A. Section Includes: Solid core flush wood doors with veneer faces.

B. Related work specified elsewhere includes:
1. Division 8 Section - "Hollow Metal Frames."
2. Division 8 Section - "Door Hardware."

1.3. SUBMITTALS:

A. Product Data: Submit door manufacturer's technical data for each type of door, including details of core and edge construction.

B. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, and other pertinent data.
1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate fire ratings for fire doors.
3. Indicate requirements for factory finishing and machining.
4. Use same reference numbers indicated on contract drawings in preparing schedules

C. Samples:
1. For Initial Selection: Submit manufacturer's full range sample charts of factory-finished doors for selection.
2. For Verification: Submit sample of selected factory finish applied to actual door face materials, approximately 8 by 10 inches for each material and finish.

1.4. QUALITY ASSURANCE:

A. Quality Standards: Comply with the following standards:
1. WDMA Quality Standard: I.S. 1-A Series, "Industry Standard for Wood Flush Doors" of Window and Door Manufacturers Association (WDMA).
2. AWI Quality Standard: "Architectural Woodwork Standards", 1st Edition, including Section 9 "Doors", of Architectural Woodwork Institute (AWI) for grade of door, core construction, finish and other requirements exceeding those of NWWDA quality standard.

B. WDMA Quality Marking:
   1. Mark each wood door with WDMA Wood Flush Door Certification Hallmark certifying compliance with applicable requirements of WDMA I.S. 1-A Series.
   2. For manufacturers not participating in WDMA Hallmark Program, a certification of compliance may be substituted for marking of individual doors.

C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
   1. Test Pressure: After 5 minutes into the test, the neutral pressure level in furnace shall be established at 40 inches (1000 mm) or less above the sill.
   2. Smoke and Draft Control: Fire rated door assemblies shall be listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

D. Single Source Limitations: Obtain doors from a single manufacturer, selecting from specified manufacturers listed herein.

1.5. DELIVER, STORAGE AND HANDLING:

A. Protect wood doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with requirements of referenced standards and recommendations of NWWDA pamphlet "How to Store, Handle, Finish, Install, and Maintain Wood Doors" as well as with manufacturer's instructions.

B. Package factory finished doors individually in opaque plastic bags or cardboard cartons.

C. Identify each door with individual opening numbers which correlate with designation system used on shop drawings for door, frames, and hardware, using temporary, removable or concealed markings.

1.6. PROJECT CONDITIONS:

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during remainder of construction period.

1.7. WARRANTY:

A. Door Manufacturer's Warranty:
   1. Submit written agreement on door manufacturer's standard form signed by Manufacturer, Installer and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup or twist), or that show telegraphing of core construction in face veneers, or do not conform to tolerance limitations of referenced quality standards.
   2. Warranty shall also include refinishing and reinstallation which may be required due to repair or replacement of defective doors where defect was not apparent prior to hanging.

3. Warranty shall commence on date of Substantial Completion.
4. Warranty Period for Solid-Core Interior Doors: Life of installation

B. Contractor's Responsibilities: Replace or refinish doors where Contractor's work contributed to rejection or to voiding of manufacturer's warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturers; subject to compliance with requirements, provide doors by one of the following:
1. Algoma Hardwoods, Inc.
2. Eggers Industries, Architectural Door Division.
3. Marshfield Door Systems, Inc.
4. Oshkosh Architectural Door Co.

2.2 INTERIOR FLUSH WOOD DOORS:

A. Solid Core Doors: Comply with the following requirements.
1. Faces for Transparent Finish: Select White Birch, Plain Sliced.
   a. Veneer Grade: Grade A faces.
   b. Veneer Matching: Book matched, center matched.
   c. Veneer face shall be consistent with similar color and appearance at both sides of doors, with no green or brown colored wood.
2. AWI Grade:
   a. Transparent Finish: Premium.
   b. Opaque Finish: Custom.
3. Solid Core Construction: PC-5 (Particle board core, 5-ply, hot-pressed method).
   a. Particleboard: Meeting ANSI A208.1, Grade LD-2.
   b. Blocking: Provide wood blocking in particleboard-core doors as follows:
      1) 5-inch top-rail blocking, in doors indicated to have closers.
      2) 5-inch bottom-rail blocking, in doors indicated to have kick, mop, or armor plates.
      3) 5-inch midrail blocking, in doors indicated to have exit devices or provide doors with structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.

A. Fire-Rated Doors: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
1. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
2. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.

3. Fire Pressure Edge Sealing System: Manufacturer's concealed integral intumescent seals located behind stiles and endrail designed to meet requirements for Category A positive pressure fire test method.

B. Mineral-Core Doors:
   1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
   2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as follows:
      a. 5-inch top-rail blocking.
      b. 5-inch bottom-rail blocking, in doors indicated to have protection plates.
      c. 5-inch midrail blocking, in doors indicated to have armor plates.
      d. 5-inch midrail blocking, in doors indicated to have exit devices.
   3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

2.3 FABRICATION

C. Factory fit doors to suit frame-opening sizes indicated.
   1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
   2. Comply with NFPA 80 requirements for fire-rated doors.

D. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3.
   1. Comply with final hardware schedules, door frame shop drawings, BHMA-156.115-W, and hardware templates.
   2. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.

2.4 FACTORY FINISHING

A. Factory finish doors that are indicated to receive transparent finish.

B. Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

C. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

D. Transparent Finish:
   1. Grade: Premium.
   2. Finish: Manufacturer's standard finish with performance comparable to AWI System 5, conversion varnish.
   3. Staining: As selected by Architect from manufacturer's full range.
   4. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine doors, frames and rough openings, with installer present, before starting installation of frames and hanging doors.
   1. Verify that doors and frames comply with indicated requirements for type, size, location, and swing characteristics.
   2. Reject doors and frames with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION:

A. Install doors complying with manufacturer's written instructions, referenced quality standard, and final reviewed shop drawings.
   1. Install fire-rated doors according to NFPA 80.
   2. Install smoke- and draft-control doors according to NFPA 105.

B. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

C. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

D. Hardware Installation: Comply with Divison 7 Section "Door Hardware."
   1. Install doors using approved hardware as scheduled.
   2. Use threaded-to-the-head wood screws furnished by hardware manufacturer to mount hardware to doors and frames. Drill pilot holes for all screws prior to installation.
   3. Attach hardware secure in correct position and alignment for proper function.

3.3 ADJUSTING, CLEANING AND PROTECTION:

A. Upon door installation, verify for proper operation, fit and swing. Make adjustments as required to ensure for smooth, quiet operation. Re-hang or replace doors which bind or sag.

B. Replace doors that are damaged or do not comply with specified requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

C. Provide protective measures to ensure that installed doors will be without damage, soils or stains throughout remainder of construction.

D. Clean finished door surfaces free of dust, smudges, soils and similar contaminations during final cleaning in accordance with finish manufacturer's recommendations.

END OF FLUSH WOOD DOORS

SECTION 087100

DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Door Hardware Schedule”.
2. Division 08 Section “Hollow Metal Frames”.
3. Division 08 Section “Flush Wood Doors”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:

1. ANSI/BHMA Certified Product Standards - A156 Series
2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS:

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door

Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

D. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.4 QUALITY ASSURANCE:

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this

Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING:

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION:

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY:

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Seven years for heavy duty cylindrical (bored) locks and latches.
2. Five years for exit hardware.
3. Twenty five years for manual surface door closer bodies.

1.8 MAINTENANCE SERVICE:

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE:

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

C. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES:

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
    a. Two Hinges: For doors with heights up to 60 inches.
    b. Three Hinges: For doors with heights 61 to 90 inches.
    c. Four Hinges: For doors with heights 91 to 120 inches.
    d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
    a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
    b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
    a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.

b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:

a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Acceptable Manufacturers:

a. Hager Companies (HA).
b. McKinney Products (MK).

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Acceptable Manufacturers:

a. McKinney Products (MK).
b. Pemko Manufacturing (PE).

2.3 DOOR OPERATING TRIM:

A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
5. Acceptable Manufacturers:

a. Hiawatha, Inc. (HI).
b. Rockwood Manufacturing (RO).
c. Trimco (TC).

2.4 CYLINDERS AND KEYING:

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

C. Cylinders: Original manufacturer cylinders complying with the following:

1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
5. Keyway: Manufacturer's Standard.

D. Patented Cylinders: ANSI/BHMA A156.5, Grade 1, certified cylinders employing a utility patented and restricted keyway requiring the use of patented controlled keys. Provide bump resistant, fixed core cylinders as standard with solid recessed cylinder collars. Cylinders are to be factory keyed where permanent keying records will be established and maintained.

1. Provide a 6 pin multi-level master key system comprised of patented controlled keys and security and high security cylinders operated by one (1) key of the highest level. Geographical exclusivity to be provided for all security and high security cylinders and UL437 certification where specified.

    a. Level 1 Cylinders: Provide utility patented controlled keyway cylinders that are furnished with patented keys available only from authorized distribution.

2. Acceptable Manufacturers:

    a. Sargent Manufacturing (SA) - Degree Series.
    b. Corbin Russwin (RU) – Access 3 Series.

E. Keying System: Each type of lock and cylinders to be factory keyed.

1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. New System: Key locks to a new key system as directed by the Owner.

F. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

G. Construction Keying: Provide construction master keyed cylinders.

H. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.5 MECHANICAL LOCKS AND LATCHING DEVICES:

A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.

1. Furnish with solid cast levers, standard 2 3/4” backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.
2. Locks are to be non-handed and fully field reversible.
3. Acceptable Manufacturers:
    a. Corbin Russwin Hardware (RU) – CL3300 Series.
    b. Sargent Manufacturing (SA) – 10 Line.

2.6 LOCK AND LATCH STRIKES:

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.7 DOOR CLOSERS:

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Acceptable Manufacturers:

   a. Corbin Russwin Hardware (RU) – DC6000 Series.
   b. Sargent Manufacturing (SA) - 351 Series.
   c. Norton Door Controls (NO) - 7500 Series.

2.8 ARCHITECTURAL TRIM:

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:

   a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Acceptable Manufacturers:

   a. Hiawatha, Inc. (HI).
   b. Rockwood Manufacturing (RO).
   c. Trimco (TC).

2.9 DOOR STOPS AND HOLDERS:

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Acceptable Manufacturers:

    a. Hiawatha, Inc. (HI).
    b. Rockwood Manufacturing (RO).
    c. Trimco (TC).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Acceptable Manufacturers:

    a. Rixson Door Controls (RF).
    b. Rockwood Manufacturing (RO).
    c. Sargent Manufacturing (SA).

2.10 DOOR COORDINATORS:

A. Door Coordinators: Soffit-mounted, non-handed, concealed lever and trigger mechanism coordinator device; meeting ANSI A156.3, Type 21.

1. Acceptable Manufacturers:

    a. Hiawatha, Inc. (HI).
    b. Rockwood Manufacturing (RO).
    c. Trimco (TC).

2.11 ARCHITECTURAL SEALS:

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Acceptable Manufacturers:

1. National Guard Products (NG).
2. Pemko Manufacturing (PE).
3. Reese Enterprises, Inc. (RE).

2.12 FABRICATION:

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.13 FINISHES:

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION:

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION:

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL:

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING:

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to

operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION:

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION:

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SCHEDULE:

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

HARDWARE SETS:

Set: 7.0

Door: 113
Storage (Pair) - Rated

6	Hinges	TA2714 4-1/2" × 4-1/2"	US26D	MK
1	Storeroom Lock	DG1 10G04 LP	US26D	SA
1	Deadbolt	DG1 485	US26D	SA
1	Dummy Trim	10U94 LP	US26D	SA
1 set	Combination Flush Bolts	2945	US26D	RO
1	Dustproof Strike	570	US26D	RO
1	Coordinator	2672 × Mtg Brkts	Black	RO
2	Door Closer	351 UO	ED	SA
2	Kick Plates	K1050 10" × 2" LDW B4E CSK	US32D	RO
2	Wall Stops	409	US32D	RO
1	Gasketing	S88BL	Black	PE
1	Astragal	355DS	Dk Bronze	PE
1	Astragal Seal	S772BL [mounting on meeting stile]	Black	PE

Set: 9.0

Door: 114
Janitor

3	Hinges	TA2714 4-1/2" × 4-1/2"	US26D	MK
1	Storeroom Lock	DG1 10G04 LP	US26D	SA
1	Mop Plate	K1050 4" × 1" LDW B4E CSK	US32D	RO
1	Wall Stop	409	US32D	RO
3	Silencers	608		RO

END OF DOOR HARDWARE

SECTION 092116

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. This Section includes the following:

1. Nonload-bearing steel framing members for interior gypsum board assemblies.
2. Gypsum board attached to steel framing including the following board types:
   a. Regular, gypsum board.
   b. Type X or type C gypsum board for fire rated assemblies.
   c. Moisture and mold-resistant gypsum board.
3. Suspended drywall furring system.
4. Sound Insulation.

B. Related Sections:

1. Division 7 Section – "Firestopping."
2. Division 8 Section – Hollow Metal Frames.
3. Division 9 Section - "Painting."

1.3 DEFINITIONS:

A. Gypsum Board Terminology: Refer to ASTM C 11 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.4 DESIGN AND PERFORMANCE REQUIREMENTS:

A. Nonload-Bearing Steel Framing Members: Framing for interior gypsum board assemblies shall be in accord with manufacturer's product data for heights and conditions of use complying with the following maximum allowable deflection.

1. Framing supporting gypsum board receiving paint, wallcovering or similar flexible finishes: L/240.
2. Framing supporting gypsum board or cement board receiving ceramic tile, stone, plaster, and similar rigid finishes: L/360.

B. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

1. Comply with fire rated assembly designs indicated or those included in the following publications:
   a. Gypsum Association: GA-600 "Fire Resistance Design Manual," current edition.
   b. Underwriters Laboratories, Inc.: UL "Fire Resistance Directory," current edition.
2. Fire-rated assembly designs by other testing and inspecting agency will be acceptable subject to approval of authorities having jurisdiction.

C. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

1.5 SUBMITTALS:

A. Product Data: Submit manufacturer's product literature, including installation instructions, indicating compliance with specified requirements.

1. Mark literature to indicate only those products proposed for use.
2. Include data for fire-rated and sound-rated partitions. Include details for acoustical sealant installation.
3. Include technical data and manufacturer's details for suspended drywall furring system.

B. Product Certificates: Submit certification signed by manufacturers of gypsum board assembly components certifying that their products comply with specified requirements.

1.6 QUALITY ASSURANCE:

A. Single-Source Limitations:

1. Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer, unless otherwise indicated.
2. Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.
3. Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING:

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other

causes. Neatly stack gypsum panels flat to prevent sagging.

1.8 PROJECT CONDITIONS:

A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.

B. Room Temperatures:

1. For non-adhesive attachment of gypsum board to framing, maintain not less than 40 degrees F. (4 deg C).
2. For adhesive attachment and finishing of gypsum board, maintain not less than 50 degrees F. (10 deg C) for 48 hours before application and continuously after until dry.
3. Do not exceed 95 degrees F. (35 deg C) when using temporary heat sources.

C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

PART 2 PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturers; subject to compliance with requirements, provide products for each of the indicated materials by one of the listed manufacturers:

1. Steel Framing and Furring:
   a. CEMCO / California Expanded Metal Products Co.
   b. ClarkDietrich Building Systems, LLC.
   c. Marino Ware / Div. Ware Industries, Inc.
   d. The Steel Network, Inc.
2. Gypsum Board and Related Products:
   a. CertainTeed Corporation.
   b. Continental Building Products, Inc.
   c. G-P Gypsum Corporation / Georgia-Pacific Company.
   d. National Gypsum Company.
   e. USG Corporation.

2.2 STEEL FRAMING FOR INTERIOR WALLS PARTITIONS AND AND CEILINGS:

A. Metal Finish for Framing : Provide steel framing members with protective finish complying with the following requirements:

1. Manufacturer's standard corrosion-resistant coating for interior applications except as otherwise specified.

2. Protective coating meeting ASTM A 653, G 40 hot-dip galvanized coating for framing members attached to and within 10-feet of exterior walls and where supporting ceramic tile finishes.

B. Steel Studs and Runners: ASTM C 645, with flange edges of studs bent back 90-degrees and doubled over to form 3/16-inch wide minimum lip (return), and complying with the following requirements:

1. Thickness: Provide minimum thickness of base (uncoated) metal as specified below.
   a. 0.0179 inch (25 gauge), minimum, unless otherwise indicated.
   b. 0.0329 inch (20 gauge) minimum, for applications as follows:
      1) For head runner, sill runner, jamb, and cripple studs at door and other openings.
      2) In locations to receive glass-mat, water-resistant, gypsum backing board for tile finishes.
2. Depth: 3-5/8 inches, minimum, unless otherwise indicated.

C. Deflection Tracks: Either of the following types specified fabricated from runners meeting ASTM C 645.

1. Single Long-Leg Runner System: Top runner with 2-inch deep flanges fabricated from same material as studs, minimum 0.0329-inch (20-gauge) thickness, installed with studs friction fit into top runner and with continuous bridging located within 12-inches of the top of studs to provide lateral bracing.
2. Double-Runner System: Nested top runners fabricated from same material as studs with inner runners having 2-inch deep flanges, minimum 0.0269-inch (22-gauge); outer runner sized to friction fit over inner runner fastened to studs.

D. Steel Rigid Furring Channels: ASTM C 645, hat shaped section, complying with the following requirements:

1. Thickness: 0.0179 inch (25 gauge) minimum base (uncoated) metal thickness, unless otherwise indicated.
2. Depth: 7/8 inch unless otherwise indicated.

E. Z-Shaped Furring: With slotted or non-slotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum bare metal thickness of 0.0179 inch (25 gauge), and depth required to fit insulation thickness or as indicated.

F. Steel Resilient Furring Channels: Manufacturer's standard product designed to reduce sound transmission, fabricated from steel sheet complying with ASTM A 653 or ASTM A 568 to form 1/2-inch deep channel of the following configurations:

1. Single-Leg Configuration: Asymmetric-shaped channel with face connected to a single flange by a single-slotted leg (web); 1-1/2 inch face width.
2. Double-Leg Configuration: Hat-shaped channel, with 1-1/2 inch wide face connected to flanges by double-slotted or expanded-metal legs (webs).

G. Steel Channel Bridging: Cold-rolled steel, 0.0598-inch minimum thickness of base (uncoated) metal and 7/16-inch wide flanges, 1-1/2 inches deep, 475 lb/1000 lineal feet, unless otherwise indicated.

H. Steel Flat Strap and Backing Plate: Steel sheet for blocking and bracing complying with ASTM A 653 or ASTM A 568, length and width as indicated; 0.0598-inch (16 gauge) minimum base metal (uncoated) thickness.

2.3 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILINGS:

A. General: Provide components of sizes indicated but not less than that required to comply with ASTM C 754 for conditions indicated.

B. Cast-in-Place and Post installed Anchors in Concrete: Anchors of type indicated below, fabricated from corrosion-resistant materials, with holes or loops for attaching hanger wires, and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E 488 conducted by a qualified independent testing agency.

1. Cast-in-place type designed for attachment to concrete forms.
2. Expansion anchor.

C. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190 conducted by a qualified independent testing agency.

D. Wire Ties: ASTM A 641, Class 1 zinc coating, soft temper, 0.062 inch thick.

E. Wire Hangers For Interior Ceilings: ASTM A 641, Class 1 zinc coating, soft temper, 0.162-inch diameter.

F. Rod Hangers: Minimum 1/4-inch diameter, galvanized, threaded cold-drawn mild steel.

G. Channels: Cold-rolled steel, 0.0598-inch minimum thickness of base (uncoated) metal and 7/16-inch wide flanges, and as follows:

1. Carrying Channels: 2-inches deep, 590 lb/1000 lineal feet, unless otherwise indicated.
2. Furring Channels: 3/4-inch deep, 300 lb/1000 lineal feet, unless otherwise indicated.
3. Finish For Interior Suspension System: Manufacturer's standard corrosion resistant zinc coating.

H. Steel Studs for Furring Channels: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:

1. Thickness: 0.0329-inch (20-gauge), unless otherwise indicated.
2. Depth: 2-1/2 inches, unless otherwise indicated.
3. Protective Coating: Manufacturer's standard corrosion-resistant coating unless indicated otherwise.

I. Steel Rigid Furring Channels: ASTM C 645, hat shaped, depth of 7/8-inch, and minimum thickness of base (uncoated) metal as follows:

1. Thickness: 0.0329-inch (20-gauge), unless otherwise indicated.
2. Protective Coating: Manufacturer's standard corrosion-resistant coating unless indicated otherwise.

2.4 SUSPENDED DRYWALL FURRING SYSTEM:

A. Acceptable manufacturers; subject to compliance with specified requirements:

1. Armstrong World Industries, Inc.
2. Chicago Metallic Corp.
3. USG Interiors, Inc.

B. Characteristics:

1. Structural Classification: Meeting ASTM C635, Heavy Duty classification.
2. System Performance: Suspension system components, hangers and fastening devices shall be capable of supporting loads of light fixtures, ceiling grilles and gypsum board with a maximum deflection of 1/360 of the span, tested in accord with ASTM C635.
3. Material: Components fabricated from minimum 0.020-inch thickness, galvanized cold-rolled steel.
4. Suspension System Components:
    a. Main Runners and Cross Tees: Double web tees with factory punched cross tee slots, hanger holes, and interlocking end tab couplings. Tees shall be of fabrication with either wide knurled metal face flanges or capped face flanges as per manufacturer's system designed for screw attachment of gypsum board panels.
    b. Cross Furring Channels: Manufacturer's hat-shaped section having knurled metal flange face with end tabs designed for interlocking with main runners.
    c. Edge Tracks: Channel or angle shaped tracks in manufacturer's standard size; same material as runners and tees.

C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641, Class 1 zinc coating, soft temper.
2. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch (12-gauge**)** diameter wire.

D. Accessories: Provide manufacturer's assorted clips, tees, struts, stabilizers, bracings and components to construct ceiling transitions, curves, offsets and bulkheads indicated.

2.5 GYPSUM BOARD PRODUCTS:

A. General:

1. Lengths: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to-end butt joints in each area indicated to receive gypsum board application.
2. Widths: Provide gypsum board in widths of 48-inches.

B. Gypsum Wallboard: Meeting ASTM C 1396 and as follows:

1. Types:
   a. Regular Gypsum Board: Provide for vertical surfaces, unless otherwise indicated.
   b. Type X or Type C Gypsum Board: Provide as required by fire-resistance-rated assemblies indicated on Drawings.
   c. Sag-Resistant Gypsum Ceiling Board: Provide for ceiling applications.
2. Edges: Tapered.
3. Thickness: As indicated on drawings.

C. Moisture and Mold Resistant Gypsum Board: Meeting ASTM C 1396, with moisture- and mold-resistant core and paper surfaces.

1. Mold Resistance: No mold growth when tested per ASTM D 3273 and having a score of 10 as rated according to ASTM D 3274.
2. Long Edges: Tapered.
3. Thickness: As indicated on drawings.

2.6 TRIM ACCESSORIES:

A. Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:

1. Material: Formed metal of steel sheet zinc coated by hot-dip process or rolled zinc or plastic:
2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
   a. Cornerbead on outside corners, unless otherwise indicated.
   b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.
   c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
   d. U-bead with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where indicated.
   e. One-piece control joint formed with V-shaped slot and removable strip covering slot opening.

2.7 JOINT TREATMENT MATERIALS

A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.

B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated. Use pressure-sensitive or staple-attached, open-weave, glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.

C. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.

1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
2. For prefilling gypsum board joints, use formulation recommended by gypsum board manufacturer.
3. For filling joints and treating fasteners of exterior gypsum ceiling/soffit boards, use formulation recommended by gypsum board manufacturer.
4. For topping compound, use sandable formulation.

D. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.

1. Ready-Mixed Formulation: Factory-mixed product.
    a. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
    b. Topping compound formulated for fill (second) and finish (third) coats.
    c. All-purpose compound formulated for both taping and topping compounds.

2.8 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant:

1. Acceptable Products:
    a. Pecora Corp., AIS-919 Acoustical and Insulation Latex Sealant.
    b. Tremco, Inc., Acoustical Sealant.
    c. Specified Technologies, Inc.; SpecSeal Smoke N' Sound Acoustical Caulk.
    d. United States Gypsum Co.; Sheetrock Brand Acoustical Sealant.
2. Type: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 83.
    a. Product shall effectively reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

b. Provide sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24)

2.9 SOUND INSULATION

A. Mineral Fiber Sound Attenuation Batts:

1. Acceptable Products; subject to compliance with specified requirements:
   a. Fibrex Insulations, Inc.; Sound Attenuation Fire Batt Insulation (SAFB)
   b. IIG MinWool, LLC; MinWool-1200 Sound Attenuation Fire Batt.
   c. Rockwool Manufacturing Co., Delta SA-Fire Board.
   d. Thermafiber, Inc.; Thermafiber Sound Attenuation Fire Blankets (SAFB).
2. Type: Unfaced, mineral fiber blankets meeting ASTM C665, Type I and ASTM C612.
   a. Density: Minimum 2.5 pcf.
   b. Combustibility: Non-combustible when tested in accord with ASTM E136.
   c. Surface burning characteristics: Meeting flame spread and smoke developed index specified when tested in accord with ASTM E84.
   d. Flame spread index: Not less than 15.
   e. Smoke developed index: Not more than 5.
   f. Thickness: As indicated on drawings or as required to meet sound rated assembly design.
   g. Size: Manufacturer's standard widths to friction fit between framing members by lengths as required.

B. Fiberglass Sound Batts:

1. Acceptable Products; subject to compliance with specified requirements:
   a. CertainTeed Corporation; CertaPro AcoustaTherm Batts.
   b. Johns Manville Corporation/Building Insulation Division; Sound Control Batts.
   c. Knauf Insulation; QuietTherm QT Batts.
   d. Owens-Corning Fiberglas Corporation; Sonobatts Insulation.
2. Type: Unfaced, fiberglass blanket insulation meeting ASTM C665, Type I.
   a. Surface burning characteristics: Meeting flame spread and smoke developed index specified when tested in accord with ASTM E84.
      1) Flame spread index: Not less than 25.
      2) Smoke developed index: Not more than 50.
   b. Thickness: As indicated on drawings or as required to meet sound rated assembly design.
   c. Size: Manufacturer's standard width equal to spacing of framing members.

2.10 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.

B. Fasteners for Metal Framing: Provide fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.

C. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft-wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.

D. Fasteners for Gypsum Board:

1. Provide steel drill screws complying with ASTM C 1002 for the following applications:
   a. Fastening gypsum board to steel members less than 0.033-inch (0.84-mm) thick.
   b. Fastening gypsum board to wood members.
   c. Fastening gypsum board to gypsum board.
2. Provide steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112-inch (0.84 to 2.84-mm) thick.

E. Laminating Adhesive: Special adhesive or joint compound as recommended by manufacturer for laminating gypsum panels. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

F. Isolation Strip at Exterior Walls:

1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates to which gypsum board assemblies attach or abut, with Installer present, including hollow-metal frames, elevator hoistway door frames, cast-in anchors, and structural framing. Examine for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine panel products before installation. Reject panels that are wet, moisture damaged, or mold damaged.

C. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate installation of ceiling suspension systems with installation of overhead structural assemblies to ensure that inserts and other provisions for anchorages to building structure have been installed to receive ceiling hangers that will develop their full strength and at spacing required to support ceilings.

B. Furnish concrete inserts and other devices indicated to other trades for installation well in advance of time needed for coordination with other construction.

3.3 STEEL FRAMING INSTALLING, GENERAL

A. Steel Framing Installation Standard: Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.

B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with recommendations of gypsum board manufacturer or, if none available, with United States Gypsum Co.'s "Gypsum Construction Handbook."

C. Isolate steel framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement. Comply with manufacturer's recommended details.

1. Where building structure abuts ceiling perimeter or penetrates ceiling.
2. Where partition framing and wall furring abut structure, except at floor.

D. Do not bridge building control and expansion joints with steel framing or furring members. Independently frame both sides of joints with framing or furring members as indicated.

3.4 INSTALLING STEEL FRAMING FOR SUSPENDED AND FURRED CEILINGS

A. Suspend ceiling hangers from building structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
3. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate

for substrate, and in a manner that will not cause them to deteriorate or otherwise fail.

4. Secure angle, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for structure as well as for type of hanger involved, and in a manner that will not cause them to deteriorate or otherwise fail.
5. Do not support ceilings directly from permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
6. Do not attach hangers to steel deck tabs.
7. Do not attach hangers to steel roof deck. Attach hangers to structural members.
8. Do not connect or suspend steel framing from ducts, pipes, or conduit.

B. Sway-brace suspended steel framing with hangers used for support. Comply with building code requirements for seismic bracing.

C. Install suspended steel framing components in sizes and at spacings indicated, but not less than that required by the referenced steel framing installation standard.

1. Wire Hangers: 48-inches on center.
2. Carrying Channels (Main Runners): 48-inches on center.
3. Furring Channels (Furring Members): 16-inches on center.

D. Installation Tolerances: Install steel framing components for suspended ceilings so that cross-furring or grid suspension members are level to within 1/8-inch in 12-feet as measured both lengthwise on each member and transversely between parallel members.

E. Wire-tie or clip furring members to main runners and to other structural supports as indicated.

3.5 SUSPENDED DRYWALL FURRING SYSTEM INSTALLATION

A. Install suspension system in accord with manufacturer's product data and ASTM C754.

B. Space hangers at 48-inches (4-ft.) on center, maximum, in each direction. Secure to building structure by wire typing to structural framing members, fastener clip devices or inserts.

C. Tie hanger wires wrapped minimum three time tight around itself, turning ends upwards.

D. Install additional hangers at end of each suspension member and at each corner of lighting fixtures.

E. Locate hangers plumb in relation to main tees and to avoid contact with insulation covering ducts and pipes. Do not pass hangers through ducts. Alter spacing of hangers or splay hangers to avoid ducts and other obstructions, but do not exceed maximum allowable ceiling areas to be supported by each hanger. Offset horizontal forces of splayed hangers by counter-splaying or bracing. Splay wires no more than 5-inches in 4-ft. vertical drop.

F. Space main tees at 48-inches (4-ft.) on center, maximum perpendicular to structural framing. Space cross tees at 2-ft. (24-inches) on center., perpendicular to main tees to form 24-inch by 48-inch (2-ft by 4-ft) grid system.

G. Level and square suspension system within specified tolerances.

H. Where grid system exists in an unrestrained condition, brace back to building structure using hanger wire, main tee or carrying channel braces spaces at 48-inches (4-ft.) on center, maximum.

I. Construct offsets, bulkheads and ceiling transitions using manufacturer's clips, struts, bracing and devices designed to provide for a secure rigid and stable installation.

J. Install edge tracks where suspension components intersects with vertical surfaces. Attach to substrates with mechanical fasteners. Cut suspension members as required to fit into tracks.

K. Do not load suspension system to exceed specified deflection limit.

3.6 INSTALLING STEEL FRAMING FOR INTERIOR WALLS, PARTITIONS AND SOFFITS

A. Install runners (tracks) at floors, ceilings, and structural walls and columns where gypsum board stud assemblies abut other construction. Where studs are installed directly against exterior walls, install asphalt felt strips or foam gaskets between studs and wall.

B. Installation Tolerances: Install each steel framing and furring member so that fastening surfaces do not vary more than 1/8-inch from the plane formed by the faces of adjacent framing.

C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.

1. Cut studs 1/2-inch short of full height to provide perimeter relief.
2. For sound insulated partitions that extend to the underside of floor/roof slabs and decks or other continuous solid structural surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as needed, to support gypsum board closures needed to make partitions continuous from floor to underside of solid structure.

D. Install steel studs and furring in sizes and at spacings indicated.

1. Single-Layer Construction: Space studs 16-inches (1'-4") on center, unless otherwise indicated.
2. Multilayer Construction: Space studs 24-inches (2'-0") on center, unless otherwise indicated.
3. Moisture and Mold Resistant Gypsum Board Construction: Space studs 16-inches (1'-4") on center, unless otherwise indicated.

E. Install steel studs so flanges point in the same direction and leading edge or end of each gypsum board panel can be attached to open (unsupported) edges of stud flanges first.

F. Frame door openings to comply with GA-219, and with applicable published recommendations of gypsum board manufacturer, unless otherwise indicated. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

1. Install two (2) studs at each jamb, unless otherwise indicated.
2. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint.
3. Extend jamb studs through suspended ceilings and attach to underside of floor or roof structure above.

G. Frame openings other than door openings to comply with details indicated or, if none indicated, as required for door openings. Install framing below sills of openings to match framing required above door heads.

3.7 APPLYING AND FINISHING GYPSUM BOARD, GENERAL:

A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.

B. Install sound insulation , where indicated, prior to installing gypsum panels unless insulation is readily installed after panels have been installed on one side. Refer to the "Sound Insulation" article in this specification section.

C. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

D. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16-inch of open space between panels. Do not force into place.

E. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Avoid joints other than control joints at corners of framed openings where possible.

F. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

G. Attach gypsum panels to framing provided at openings and cutouts.

H. Spot grout hollow metal door frames for solid-core wood doors, hollow metal doors, and doors over 32-inches (2'-8") wide. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.

I. Form control and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

J. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases that are braced internally.

1. Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8-sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4-inch to 3/8-inch wide joints to install sealant.

K. Isolate perimeter of nonload-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4-inch to 1/2-inch wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

L. Where sound insulated gypsum board assemblies are indicated, seal construction at perimeters, behind control and expansion joints, openings, and penetrations with a continuous bead of acoustical sealant including a bead at both faces of the partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.

M. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

N. Space fasteners in panels that are tile substrates a maximum of 8-inches on center.

3.8 GYPSUM BOARD APPLICATION METHODS

A. Single-Layer Application: Install gypsum wallboard panels as follows:

1. On ceilings, apply gypsum panels prior to wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.
    a. Stagger abutting end joints not less than one framing member in alternate courses of board.
    b. At high walls, install panels horizontally.

B. Multilayer Application on Partitions/Walls: Apply gypsum board indicated for base layers and gypsum wallboard face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints. Stagger joints on opposite sides of partitions.

C. Single-Layer Fastening Methods: Apply gypsum panels to supports fastened with screws.

D. Multilayer Fastening Methods: Apply base layers of gypsum panels and face layer to base layers by fastening base layers with screws and face layer with adhesive and supplementary fasteners.

E. Direct-Bonding to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's recommendations, and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.9 INSTALLING TRIM ACCESSORIES

A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.

B. Install cornerbead at external corners.

C. Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.

1. Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.
2. Install L-bead where edge trim can only be installed after gypsum panels are installed.
3. Install U-bead where indicated.

D. Install control joints according to ASTM C 840 and manufacturer's recommendations and in specific locations approved by Architect for visual effect.

3.10 FINISHING GYPSUM BOARD ASSEMBLIES

A. General: Treat gypsum board joints, interior angles, flanges of cornerbead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.

B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.

C. Apply joint tape over gypsum board joints, except those with trim accessories having flanges not requiring tape.

D. Levels of Gypsum Board Finish: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated.

1. Level 1 for ceiling plenum areas and concealed areas, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies. Embed tape at joints.

2. Level 2 where gypsum board panels form substrates for ceramic tile and where indicated. Embed tape and apply separate first coat of joint compound to tape, fasteners, and trim flanges.
3. Level 4 for gypsum board to receive flat paint finish, at surfaces that will be exposed to view, and for all other locations not otherwise specified. Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges.
4. Level 5 for gypsum board to receive gloss or semi-gloss paint finish, including epoxy paints. Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges, and apply skim coat of joint compound over entire surface

3.11 SOUND INSULATION

A. Install to gypsum drywall partitions after first layer of gypsum board is installed.

B. Install sound insulation with snug joints in accord with manufacturer's instructions to secure insulation in place.

C. Where installed above ceilings, lay insulation flat. Install unfaced batts over suspended ceilings at partitions in width that extends on either side of partition as indicated.

3.12 FIELD QUALITY CONTROL

A. Above-Ceiling Observation: Architect will conduct an above-ceiling observation prior to installation of gypsum board ceilings and report any deficiencies in the Work observed.

1. Notify Architect one week' in advance of the date and the time when the Project, or part of the Project, will be ready for an above-ceiling observation.
2. Prior to notifying Architect, complete the following in areas to receive gypsum board ceilings:
    a. Installation of 80-percent of lighting fixtures, powered for operation.
    b. Installation, insulation, and leak and pressure testing of water piping systems.
    c. Installation of air duct systems.
    d. Installation of air devices.
    e. Installation of mechanical system control air tubing.
    f. Installation of ceiling support framing.

B. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.

3.13 CLEANING AND PROTECTION

A. Promptly remove any residual joint compound from adjacent surfaces.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, or mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

D. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure gypsum board assemblies are without damage or deterioration at the time of Substantial Completion.

END OF GYPSUM BOARD ASSEMBLIES

SECTION 093000

TILING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. Section Includes:
   1. Porcelain tiles.
   2. Tile setting materials and accessories.

B. Related Sections:
   1. Division 9 Section - Gypsum Board Assemblies.
   2. Division 9 Section - Joint Sealants.
   3. Division 22 Plumbing sections.

1.3 SUBMITTALS:

A. Product Data: Submit manufacturer's product literature and installation instructions for each type tile and for manufactured mortars, grouts, sealants and accessories. Include proportioning and mixing instructions for mortars, grouts, and latex additives.

B. Samples:
   1. Tile: Submit minimum 12-inch by 12-inch (1-ft. by 1-ft.) size sample panels for each type tile in colors and textures selected. Prepare samples consisting of minimum four actual size tile units mounted on plywood or hardboard panels with grouted joints in width, color and material specified.
   2. Trim and Accessories: Submit actual size sample of each type trim and accessory required.
   3. Sealant: Submit actual sealant material sample in selected color(s) for Architect's approval.

C. Master Grade Certificates: Submit certificates for each shipment and type tile indicating that materials conform with ANSI A137.1-2008.
   1. Certificates shall indicate grade and types of tile, manufacturer's name, package identification numbers, date of shipment, name and location of project.
   2. Tile manufacturer shall sign and issue certificates at time of shipping.

D. Setting and Grouting Material Approval: Submit letter from mortar and grout manufacturer approving products proposed for use in accordance with setting and grouting material requirements specified herein.

E. Maintenance Data: Submit manufacturer's maintenance instruction for care and cleaning of each type tile. Indicate recommended cleaning products, methods and maintenance procedures. Include as part of Project Closeout documents

1.4 QUALITY ASSURANCE:

A. Installer Qualifications: Installer shall have minimum Five (5) years' experience in satisfactory completion of tile installations of similar nature and scope as required for this project. If requested by Architect, submit evidence of satisfactory installations of similar work completed within the past three years; provide project list with references indicating architect and owner contact information.

B. Setting and Grouting Material Requirements: Setting mortars and grouts shall be products of a single manufacturer. Products shall be as recommended and approved in writing by manufacturer, meeting specified requirements, for installation and substrate conditions indicated.

C. Allowable Tolerances: Finished work shall be plumb, level and true to line within ±1/4-inch in an undivided space and ±1/16-inch maximum in a running foot, non-cumulative.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials in manufacturer's original containers with labels intact and legible, identifying brand name and contents.

1. Tile cartons shall be sealed with labeled grade marking by manufacturer complying with ANSI A137.1, with grade seals unbroken.
2. Manufactured mortars, and grouts shall bear hallmarks certifying compliance with specified standards.

B. Store tile in original cartons with grade seals unbroken. Protect stored materials from damage or contamination from weathering, freezing, foreign matter, and other detrimental conditions.

C. Handle tile materials to prevent from cracking, chipping, breaking and other damages. Damaged tile shall not be permitted for installation and removed from site. Replace damaged materials at no additional cost to Owner.

1.6 PROJECT CONDITION:

A. Environmental Requirements:

1. Maintain temperatures above 50-degrees F. but not exceeding 100-degrees F. in areas to receive tile during installation and minimum seven (7) days after completion unless otherwise directed by manufacturer's instruction.
2. If field mixed mortars and grouts are used, prepare mixtures when ambient temperatures are above 50-degrees F.
3. Comply with manufacturers recommended temperature conditions for factory-mixed mortars and grouts. Do not mix or use when temperature conditions are below minimum requirements.

4. Substrate temperatures shall be minimum 50 degrees F. and rising at time of installation unless otherwise directed by manufacturer's instructions. Do not apply setting materials to surfaces that contain frost.

B. Protection:

1. Provide barricades or protective methods to prevent traffic on tiled floor areas during installation and afterwards until materials are set firm.
2. Prohibit traffic on tiled floors for minimum seven days after grouting is completed.

PART 2 PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Tile Manufacturers; subject to compliance with specified requirements:

1. American Olean Tile Company.
2. Crossville Inc.
3. Dal-Tile Corporation.
4. Florim USA / Florim Ceramiche S.P.A.

2.2 CERAMIC TILE:

A. Basis of Design: Tile products are as schedule on drawings and shall serve as the basis of design.

1. Tile products of similar design, construction, material composition, size, finish and quality by other acceptable manufacturers may be submitted for Architect's acceptance.
2. Acceptance is subject to compliance with specified requirements as evidenced by submittal of manufacturer's product data, material certificates, test reports and samples.

B. Porcelain Tiles:

1. Type: Impervious, porcelain paver meeting ANSI A137.1.
2. Nominal Face Size: As selected by Architect from manufacturer's standard, unless otherwise indicated on drawings.
3. Thickness: 9 mm (3/8-inch), nominal.
4. Edges: Cushion or Square.
5. Color: As selected by Architect from manufacturer's full range color selection.
6. Trim Shapes: Provide bullnose and corner units as required; matching porcelain tile in color, size and thickness.

2.3 SETTING MATERIALS:

A. Latex-Portland Cement Mortar:

1. Acceptable Products; subject to compliance with specified requirements:
   a. Custom Building Products; MegaFlex® Crack Prevention Mortar.
   b. H.B. Fuller Construction Products, Inc.; TEC 3N1 Performance Mortar.

c. Laticrete International, Inc.; 254 Platinum.

d. Mapei Corporation, Ultraflex 3.

2. Type: Prepackaged premium high bond strength, polymer modified dry-mortar mix meeting ANSI A118.15, composed of portland cement, graded aggregates and dry, redispersible, vinyl acetate or acrylic additives formulated for job-mixing with only water. Mortar shall be non-sag formulation designed for floor and wall installations and acceptable for applications in exterior and interior environments.

2.4 GROUT MATERIALS:

A. Polymer Modified Cement Grout:

1. Acceptable Products; subject to compliance with specified requirements:

a. Custom Building Products; Prism SureColor Grout.

b. H.B. Fuller Construction Products, Inc.; TEC Power Grout.

c. Laticrete International, Inc.; Permacolor Grout.

d. Mapei Corporation; Ultracolor Plus Grout.

2. Type: Factory-prepared, polymer modified, sanded grout meeting ANSI A118.7; composed of portland cement or aluminate cement, graded aggregates, color-fast mineral oxide pigments, additives and dry, redispersible, latex/polymer powder formulated for job-mixing with only water.

3. Color: As selected by Architect from manufacturer's standard colors.

2.5 CONTROL AND EXPANSION JOINT MATERIALS:

A. Sealant:

1. Acceptable Products; subject to compliance with specified requirements:

a. BASF Corporation; MasterSeal NP 2.

b. Pecora Corp., Dynatrol II.

c. Tremco, Inc.; Dymeric 240 or 240FC.

d. Sika Corporation; Sikaflex-2c NS.

2. Characteristics: Two-part, polyurethane-based sealant with separate pre-packaged pigmented concentrate color additive; meeting ASTM C920, Type M, Grade NS, Class 25.

a. Hardness: Shore A, 25 or greater when tested according to ASTM C661.

b. Colors: Matching grout color as selected by Architect.

B. Accessories:

1. Primer: Type recommended by sealant manufacturer.

2. Backup material: Flexible, non-compressive foam type as recommended by sealant manufacturer.

3. Divider strips: Type acceptable to sealant manufacturer.

2.6 CLEANING MATERIALS:

A. Tile and Grout Cleaners: Non-corrosive, non-acid based, neutral type as recommended and acceptable to tile and grout manufacturers; compatible with installed materials.

PART 3 EXECUTION

3.1 EXAMINATION:

A. Examine substrate conditions to verify that surfaces to receive tile is sound, firm, dry, clean and free of oily or waxy films and curing compounds.

B. Verify that grounds, anchors, plugs, hangers, bucks, electrical and mechanical work in or behind tile have been installed prior to proceeding with tile work.

C. Notify Architect of any conditions detrimental to proper installation of materials. Make corrections to defective or unsatisfactory conditions as required.

D. Do not proceed with installation until defective or unsatisfactory conditions have been corrected and is acceptable to installer and Architect.

3.2 SUBSTRATE PREPARATION

A. Where tile is to be installed over existing painted masonry surfaces, remove paint from masonry surfaces to produce clean sound substrate for bonding of tile setting mortar.

1. Remove paint from existing masonry surfaces by chemical, mechanical, or abrasive-blast cleaning methods according to applicable requirements of SSPC-SP13 and as recommended by paint manufacturer.
2. Clean substrate surfaces of laitance, paint residue and other foreign matter after completion of paint removal operations.
3. Vacuum substrate surfaces clean before start of tile setting work.

B. Patch and repair holes, depressions and damages to masonry resulting from paint removal work using cement-based masonry patching compound to provide a smooth, even, uniform surface for tile installation.

C. Substrate surface preparation shall be acceptable to tile installer. Installation of tile materials to substrates by installer shall confirm acceptance that conditions are satisfactory.

3.3 TILE INSTALLATION:

A. Install tile complying with TCNA installation methods indicated and applicable installation standards of ANSI A108, except where more stringent requirements are specified.

B. Locate accessories, control joints and expansion joints before installing tile. Coordinate location and alignment with tile joints.

C. Layout: Center tiles within areas to avoid unequal tile widths at opposite walls and tiles of less than 1/2 tile width.

1. Align tile joints straight, perpendicular and parallel to walls unless otherwise indicated.
2. Terminate tile fitted neat at obstructions, edges and corners without disrupting pattern or joint alignment.

D. Cutting and Fitting: Cut and drill tiles without damaging or marring exposed tile faces. Rub cut edges smooth with carborundum stone.

1. Grind and fit tile at intersections, against trim and at built-in fixtures and accessories.
2. Fit tile around outlets, pipes, fixtures and fittings so that tile edges will be concealed under applied escutcheons, collars or plates.

E. Grout Joints: Provide 3/16-inch joint width, unless otherwise indicated. Maintain uniform joint widths, straight and aligned throughout installation.

3.4 CONTROL AND EXPANSION JOINTS:

A. Locate control and expansion joints in accordance with TCNA EJ171. Location of joints shall be approved in advance by Architect.

B. Construct control and expansion joints extending through tile and setting bed. Leave joint cavities open, free of dirt, debris, grout, mortar and setting materials for installation of compressible materials and sealant. Do not saw cut joints after installation of tiles.

1. Provide control joints at perimeter of tile areas abutting dissimilar materials and changes of substrates.
2. At vertical internal corners of wall tiles and where tiles abut dissimilar materials provide sealant control joints in lieu of grout joints.
3. Where tile work occurs over control joints or cold joints in structure, provide tile expansion joint located direct over structural joints. Width of tile expansion joint shall be same as structural joint width.

C. Width of tile control and expansion joints shall match width of grout joints, but not less than 1/4-inch, except for structural joints required to extend through tile shall be of matching width or greater.

D. Seal joints in accordance with TCNA EJ171. Prime joints and install sealant materials and related accessories in accordance with manufacturer's product data. Tool sealant joint concave.

3.5 TILE INSTALLATION METHODS

A. Wall Tile; Thin-Set Over Masonry, Interior:

1. Installation Method: TCNA W202I-18.
2. Setting Method: Latex-portland cement mortar.
3. Grout Type: Polymer modified cement grout.

3.6 CLEANING AND PROTECTION

A. Keep tile surfaces clean as work progresses. Do not permit setting and grouting materials, residue and other foreign materials to accumulate on tile face. Clean tile upon completion of installation as specified.

B. Clean installed tile in accordance with tile and grout manufacturer's recommendations using specified cleaners after setting materials have cured.

1. Allow grout installation to cure for minimum fourteen (14) days prior to

permitting tile work to be cleaned.

2. Do not use acid solutions to clean tile.

C. Protection:

1. Upon completion of tile installation and after cleaning of tile and grout joints, protect tile work throughout remainder of construction by covering with heavy duty kraft paper or hardboard.
2. Prior to Date of Substantial Completion, remove protective covering for final cleaning.

END OF TILING

SECTION 096723

RESINOUS FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 SUMMARY:

A. Section Includes: Epoxy quartz resinous flooring system.

B. Extent of fluid-applied resinous flooring is shown on drawings and in schedules, including in part, the following:
   1. Fluid applied resinous flooring and integral formed base.
   2. Joint, edge and termination strips.
   3. Accessories necessary for complete installation.

C. Related Sections:
   1. Division 7 Section – "Joint Sealants."
   2. Division 9 Section – "Tiling."
   3. Division 9 Section – "Painting."

1.3 PERFORMANCE REQUIREMENTS:

A. Flooring Slip-Resistance: Products and installation, surfaces' coefficient of friction (slip-resistance) under the work of this Section shall be in compliance with the more stringent of applicable provisions of the following, including revisions and amendments:
   1. Americans With Disabilities Act of 1990 (ADA) "Accessibility Guidelines" (ADA-AG).
   2. "2010 ADA Standards for Accessible Design", Published in the Federal Register September 15, 2010.
   3. American National Standards Institute (ANSI), ANSI A 117.1, 2003.
   4. International Building Code (IBC), 2012 edition with State of Georgia amendments.

B. Flammability: Self-extinguishing according to ASTM D 635.

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's technical data for each type of fluid-applied resinous flooring and accessory.
   1. Include color charts of manufacturer complete range for selection by Architect.
   2. Submit manufacturers application instructions with descriptive data and specific recommendations for mixing, application and curing, including any precautions

of special handling instructions required to comply with the Occupational Safety and Health Act.

B. Shop Drawings: Show floor system components and extent of installation.
   1. Include details for cove base, terminations, floor material transitions and other conditions where adjoining equipment is located.
   2. Locate and provide detailing for flexible joints required for flooring in area of installation.
   3. Indicate locations where waterproofing membrane application is required.

C. Samples: Submit 6 by 6 inch cured samples of flooring system indicating color combination and non-skid properties. Include samples of textured surface finishes. Approved samples will be used during installation for product match.

D. Certified Test: Submit two copies of suppliers/ manufacturers written certification that flooring system meets or exceeds required properties. (Submit for Architect's information only)

E. Installer Qualifications: Submit certificates signed by manufacturer certifying that installers comply with specified requirements. (Submit for Architect's information only)

F. Maintenance Instructions: Submit current copies of the flooring manufacturer's printed recommendations on maintenance methods and products. Include as part of Project Closeout documents.

1.5 QUALITY ASSURANCE:

A. Installer Qualifications: Installer shall be trained and approved by resinous flooring manufacturer for installation of systems specified for this Project.
   1. Installer shall have not less than Five (5) years' experience in applying resinous flooring systems similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance. If requested by Architect, submit references for projects completed within the past Three (3) years.
   2. Installer shall also employ only persons trained and approved by resinous flooring manufacturer for applying specified systems on this Project.

B. Single Source Requirements: Materials used in the floor surfacing shall be the products of a single manufacturer.

C. Manufacturer's Field Service: Obtain the services of resinous flooring manufacturer's field representative to inspect and observe preparation of concrete substrates receiving specified materials. Representative shall approve substrate conditions for application of resinous flooring materials.

D. Installer Responsibilities:
   1. Installer shall verify locations of all flexible joints required by the provisions of this Section and by the recommendations of the related material manufacturers.

2. Installer shall keep daily log of the date of installation, room number, type, color, and method of application of product being installed. Log must be available for inspection by the Architect upon request.

E. Mock-Up: Prior to starting application of flooring, provide full scale portable mock-up for approval by Architect and Owner to establish acceptable quality, durability, and appearance. Mock-up size shall not be less than four (4) square feet.
1. Acceptable mock-up shall be the standard of quality for installed work.
2. Unacceptable installed work to be removed and replaced until acceptable. Aesthetically unacceptable but well bonded work may be overlaid or recoated per Manufacturer's instructions if thickness clearances permit.
3. Obtain Architect's approval of mock-up before installing flooring.

F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to flooring application including, but not limited to, the following:
1. Substrate conditions, including at least results of pH, moisture content and adhesion testing (and any required retesting).
2. Verify selected colors and finishes.
3. Temporary protection requirements for flooring system during and after installation.

1.6 DELIVERY, STORAGE, AND HANDLING:

A. All materials shall be delivered to project site in original manufacturer's sealed containers including type of material, batch numbers, date of manufacture, and pertinent labels intact and legible.

B. Store materials in dry protected area at a temperature between 60° F to 80° F.

C. Follow all manufacturer's specific instructions and prudent safety practices for storage and handling.

1.7 PROJECT CONDITIONS:

A. Comply with manufacturer's written recommendations regarding preparation, testing and installation.
1. Maintain the ambient room and the floor temperatures at 60 degrees Fahrenheit, or above, for a period extending from 72 hours before, during and after floor installation.
2. Concrete to receive surfacing shall have cured for at least 28 days and shall have been free of water for at least 7 days.

B. Dew Point: Substrate temperature must be minimum of 5 degrees above dew point prior to, during or up to 24 hours after application of flooring system.

C. Illumination: Apply flooring system only where a minimum of 30 footcandles exist when measured 3 feet from surface.

D. Advise other trades of fixtures and fittings not to be installed until flooring is cured and protected.

1.8 PROTECTION:

A. Protect adjacent surfaces not scheduled to receive the flooring by masking, or by other means, to maintain these surfaces free of the flooring material.

B. Provide adequate ventilation and fire protection at all mixing and placing operations. Prohibit smoking or use of spark or flame producing devices within 50 feet of any mixing or placing operation.

C. Provide polyethylene or rubber gloves or protective creams for all workmen engaged in applying products containing epoxy.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturers; subject to compliance with specified requirements:
1. BASF Construction Chemicals, LLC.
2. Cornerstone Flooring.
3. Key Resin Company.
4. Prime Coat Coating Systems.
5. Stonhard, Inc.
6. Tnemec Company, Inc.

2.2 EPOXY QUARTZ RESINOUS FLOORING SYSTEM:

A. Basis of Design: Key Resin Company, "Key Quartz B-125" grouted and sealed with Key #512 two component UV light resistant epoxy.
1. Resinous flooring system of similar design, construction, material composition, properties and finish by other acceptable manufacturers may be submitted for Architect's acceptance.
2. Acceptance is subject to compliance with specified requirements as evidenced by submittal of manufacturer's product data, material certificates, test reports and samples.

B. System Description: System shall be 1/8-inch textured epoxy surfacing with broadcast colored quartz to form a decorative skid-resistant surface. Surface finish shall be a clear two component UV light resistant epoxy grout and sealer.
1. Integral Cove Base: Provide 6-inches height coved base at vertical surfaces, including at curbs.
2. Wearing Surface Finish: Textured for slip resistance as selected by Architect from manufacturer's standard light to medium ranges and complying with required coefficient of friction.
3. Colors and Patterns: As selected by Architect from manufacturer's full range selection.

C. Physical Properties:
1. Weight: 1.00 lbs/sq.-ft. per 1/8-inch thickness.
2. Compressive Strength: 11,500 psi when tested per ASTM C 579.
3. Tensile Strength: 2,400 psi when tested per ASTM C 307.
4. Flexural Strength: 4,300 psi when tested per ASTM C 580.
5. Indentation: Withstands 2,000 psi for 30 mins. without indentation in accord with MIL-D-3134F Sec. 4.7.4
6. Impact Resistance: 16 ft/lbs.; no chipping, cracking, or delamination in accord with MIL-D-3134F, Sec. 4.7.3
7. Adhesive Strength to Concrete: 300 psi (100% concrete failure) in accord with ACI Committee 403.
8. Water Absorption: 0.10 when tested per ASTM D 570.
9. Abrasion Resistance: 32 mg., maximum, when tested per ASTM C 501.
10. Thermal Shock Resistance: Passes when tested per ASTM C 884.
11. Thermal Coefficient of Expansion: 22×10^{-6} in/ in/ °F. when tested per ASTM C 531.

2.3 SYSTEM MATERIALS:

A. Flexible Membrane for crack treatment: 100% solids flexible epoxy.

B. Prime Coat: Two component penetrating epoxy or optional moisture vapor control epoxy system. Silica filler added to primer resin for overlaying and leveling floor substrate.

C. Aggregates:
1. Blended quartz sand for base.
2. Color coated quartz with a minimum Mohs. hardness of 6.

D. Matrix: Matrix-epoxy/aggregate composition.

E. Grout and Topcoat(s): Clear two component UV light resistant epoxy.

2.4 ACCESSORY MATERIALS:

A. Patching and Fill Material: Resinous products of or approved in writing by flooring manufacturer as recommended for application indicated.

B. Waterproofing Membrane: Fluid-applied urethane or epoxy-based type membrane system as recommended by flooring manufacturer for substrate and primer and body coats indicated. Waterproofing membrane shall be compatible with flooring system components.

C. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated.

2.5 MIXING:

A. Mix components and prepare materials according to flooring manufacturer's written instructions to achieve specified physical properties

PART 3 - EXECUTION

3.1 PREPARATION:

A. Preparation of Surface:
   1. Inspect surfaces to receive flooring and verify that condition is smooth and free from conditions that will adversely affect execution, permanence, or quality of work.
   2. Remove all projections, all debris detrimental to flooring system, and dirt, oil contaminates, grease, and surface coatings affecting bond.
   3. Notify Architect in writing prior to commencing work of any conditions deemed unsatisfactory for the installation; installation of flooring materials is understood as acceptance of the substrate as satisfactory.

B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
   1. Roughen concrete substrates to provide surfaces texture acceptable to flooring manufacturer for application of materials. Shot-blast surfaces with an apparatus that abrades the concrete surface. Use shot blasting machines that contains the dispensed shot within the apparatus, and re-circulates the shot by vacuum pickup to perform surface abrasion work
   2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
   3. Verify that concrete substrates are dry.
      a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 3-lbs. of water/1000 sq. ft. of slab in 24 hours.
      b. Perform plastic sheet test, ASTM D 4263. Proceed with application only after testing indicates absence of moisture in substrates.
      c. Perform additional moisture tests recommended by manufacturer. Proceed with application only after substrates pass testing or moisture mitigation sealer has been applied to floor substrates to remedy test failures.
   4. Verify that concrete substrates have neutral Ph and that resinous flooring will adhere to them. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.

C. Patching and Filling: Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

D. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.
   1. Rout out all cracks larger than 1/32-inch width and fill with crack filler approved by manufacturer of floor materials.
   2. Apply manufacturer recommended flexible membrane across the crack in accordance with instructions.

3.2 INSTALLATION:

A. Install all floor materials in strict conformance with manufacturer's instructions.

B. Prime entire surface with recommended primer or moisture vapor control treatment, apply prior to installation of crack isolation membrane and also use to fill cracks. For areas that slope to drain, add fume silica to create a paste consistency or use recommended epoxy paste.

C. Apply epoxy binder and broadcast decorative aggregate in two applications to achieve a minimum thickness of 1/8-inch.

D. Apply UV light resistant epoxy grout coat and topcoat(s) to provide a uniform, dense surface.

E. Match finished work to approved samples, uniform in thickness, sheen, color, pattern and texture, and free from defects detrimental to appearance.

F. Integral Cove Base: Provide integral cove base formed from flooring extending up wall substrate to required height.

3.3 CLEANING AND PROTECTION:

A. Provide temporary protection until flooring installation work is cured.

B. Protect resinous flooring from damage and wear during the remainder of construction period.

C. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

D. Prior to Date of Substantial Completion, clean floor surfaces using cleaning solutions and methods as recommended by resinous flooring manufacturer.

END OF RESINOUS FLOORING

SECTION 099100

PAINTING

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

1.2 1.2 SUMMARY:

A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces, except where noted otherwise.

1. Surface preparation, priming, and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.
2. Painting includes field painting exposed steel and iron work, and primed metal surfaces.

B. Paint exposed surfaces whether or not colors are designated in "schedules," except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.

C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.

1. Examples of prefinished items not to be painted include, in part, the following factory-finished components:
   b. Acoustic materials.
   c. Plastic laminate casework.
   d. Finished mechanical and electrical equipment.
   e. Light fixtures.
   g. Distribution cabinets.
   h. Signage, Plaques, Directories, and Bulletin Boards.
   j. Finish Hardware.
2. Examples of concealed surfaces not to be painted include, in part, wall or ceiling surfaces in the following generally inaccessible areas:
   a. Foundation spaces.
   b. Furred areas.
   c. Utility tunnels.
   d. Pipe spaces or chases.
   e. Duct shafts.
3. Examples of Finished metal surfaces not to be painted include, in part, the following:
   a. Anodized aluminum.
   b. Stainless steel.

c. Chromium plate.
d. Copper.
e. Bronze.
f. Brass.
g. Prefinished aluminum-cladding on wood windows and trim.

4. Examples of operating parts not to be painted include, in part, moving parts of operating equipment such as the following:

a. Valve and damper operators.
b. Linkages.
c. Sensing devices.
d. Motor and fan shafts.

5. Labels: Do not paint over Underwriter's Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

D. Related Sections: The following sections contain requirements that relate to this section:

1. Divisions 5 Sections, for shop priming metal work.
2. Division 6 Sections, for shop finishing woodwork.

1.3 SUBMITTALS:

A. Product Data: Manufacturer's most current technical information, label analysis, and application instructions for each material proposed for use.

1. List each material and cross-reference to scheduled paint types, and including each specific coating, finish system, and application.
2. Identify each material by the manufacturer's catalog number and general classification.

B. Samples:

1. For Initial Selection: For each type of finish-coat material indicated, submit manufacturer's color chips for surfaces to be coated.
2. For Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate.

a. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.

b. Provide a list of materials and applications for each coat of each sample. Label each sample for location and application.

c. Submit samples on the following substrates for Architect's review of color and texture only.

1) Concrete Unit Masonry: 4-by-8-inch samples of masonry, with mortar joint in the center, for each finish and color.
2) Ferrous Metal: 3-inch square samples for each color and finish applied on flat metal.

1.4 QUALITY ASSURANCE:

A. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

B. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates.

1. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
2. Notify the Architect of any problems anticipated using the materials specified, prior to proceeding with work.

C. Material Quality: Provide the manufacturer's best quality grade paint material of the various coating types specified.

1. Paint material containers not displaying manufacturer's product identification will not be acceptable.
2. Proprietary names used to designate colors or materials are not intended to imply that products named are required or to exclude approved equivalent products of other manufacturers.

D. Color Pigments: Pure, non-fading, applicable types to suite substrates and service indicated.

E. Lead content in pigments or other painting materials and components is not allowed.

1.5 DELIVERY, STORAGE, AND HANDLING:

A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's name, stock number, and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.

B. Store materials not in use in tightly covered containers in a well- ventilated area at a minimum ambient temperature of 45-deg F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.
2. Take necessary measures to ensure that workers, others present or passing through or inspecting work areas (painting or any other work), and the work areas themselves are protected from fire and health hazards resulting from handling, mixing, and application of materials.

1.6 JOB CONDITIONS:

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50-degrees F. and 90-degrees F., unless otherwise permitted by paint manufacturer's printed instructions.

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45-degrees F. and 95-degrees F., unless otherwise permitted by paint manufacturer's printed instructions.

C. Do not apply paint in snow, rain, fog, or mist, or when the relative humidity exceeds 85-percent, or at temperatures less than 5-degrees F above the dew point, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.

1. Apply no materials in spaces where dust is being generated.
2. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer, during application, drying and curing periods.

PART 2 PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturers; subject to compliance with requirements, provide products of one of the following:

1. Benjamin Moore and Company.
2. PPG Industries, Inc.
3. The Sherwin-Williams Company.

2.2 PAINT MATERIALS:

A. Standard of Quality:

1. Except as otherwise noted, products specified as a standard of quality are manufactured by Sherwin-Williams Company. Products of other specified acceptable manufacturers listed, similar in type and quality, are acceptable for use, subject to approval of product list submitted for review.
2. Where products other than those of the manufacturer listed as the standard of quality are specified in Painting Schedule, such products have been selected to achieve specific results and substitutions will be allowed only in accordance with Conditions of the Contract.

B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. Paint thinners and tints shall be products of same manufacturer as paints or approved by manufacturer for use with their products. Use thinners only within the recommended limits if required.
3. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

C. Color Pigments: Pure, non-fading, applicable types to suite substrates and service indicated.

D. Hazardous Materials Prohibition: Lead content in pigments or other painting materials and components is not allowed.

E. Colors: As selected by Architect from manufacturer's full range, unless otherwise indicated on Drawings.

PART 3 EXECUTION

3.1 EXAMINATION:

A. Examine substrates and conditions under which painting will be performed for compliance with requirements for application of paint.

1. Do not begin paint application until unsatisfactory conditions have been corrected.
2. Start of painting will be construed as the Applicator’s acceptance of surfaces and conditions within a particular area.

3.2 PREPARATION:

A. Preparatory Procedures: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items in place that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items if necessary for complete painting of the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.

1. Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to cleaning.
2. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

B. Surface Preparation: Clean and prepare surfaces to be painted in accordance with the manufacturer’s instructions for each particular substrate condition and as specified. Surface shall be clean, dry and free from dust, dirt, chalk, mildew, loose paint, oil, grease, wax, efflorescence and any other contamination.

1. Incompatible Primed Surfaces: Provide barrier coats over incompatible primers or remove and re-prime. Notify Architect in writing of problems anticipated with using the specified finish-coat material with substrates primed by others.
2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
    a. Use abrasive blast-cleaning methods if recommended by the paint manufacturer.
    b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause blistering

and burning of finish paint, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.

3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
   a. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
   b. Prime, stain, or seal unfinished wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
   c. When transparent finish is required, backprime with spar varnish.
   d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
   e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.
4. Ferrous Metals: Clean nongalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.
   a. Treat bare, sandblasted, or pickled clean metal with a metal treatment wash coat before priming.
   b. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.
5. Galvanized Surfaces: Clean galvanized surfaces with non- petroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
6. Existing Painted Masonry: Where existing paint is loose or blistered, remove by scraping or brushing.
   a. Remove debris and chalking from surfaces after scraping by washing with detergent and water. Flush surfaces with clean water.
   b. Touch-up surfaces with paint material specified and prepare for re-painting.
7. Existing Painted Surfaces: Remove loose paint and blisters by scraping and sanding.
   a. Sand glossy finishes to provide grippable surface for paint adhesion. Feather sand edges and remove sanding dust.
   b. Remove dirt, debris and chalk by washing with detergent and water. Rinse with clean water and allow substrates to dry.

C. Materials Preparation: Carefully mix and prepare paint materials in accordance with manufacturer's directions.
   1. Maintain containers used in mixing and application of paint in a clean condition,

free of foreign materials and residue.

2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
3. Use only thinners approved by the paint manufacturer, and only within recommended limits.

D. Tinting: Tint each primer and undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied.

1. Tint undercoats to match the color of the finish coat(s), but provide sufficient differences in shade of undercoats to distinguish each separate coat.
2. Finish coats as scheduled, shall be same color for each coat required.

3.3 APPLICATION:

A. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied

1. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
2. Paint surface treatments and finishes are indicated on the Drawings and in Specifications.
3. Finish colors will be selected after Bidding, unless indicated otherwise.
4. Provide finish coats that are compatible with primers used.
5. The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce an even smooth surface in accordance with the manufacturer's directions.
6. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
7. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, connector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection.
8. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.
9. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
10. Finish doors on tops, bottoms, and side edges same as faces.
11. Sand lightly between each succeeding enamel or varnish coat.

B. Primers:

1. Omit primer on metal surfaces that have been shop-primed and touch-up painted,

only after verifying full compatibility of shop primers with materials specified for the next coat and finish coats.

2. Primer may be omitted at previously painted existing surfaces in good condition, except at interior concrete, plaster and drywall surfaces, after repairs to any existing damaged substrates and after spot priming of existing damaged paint finish, followed by cleaning and preparation recommended in writing by paint manufacturer.

C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Allow sufficient time between successive coats to permit proper drying.
2. Do not recoat until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure and where application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

D. Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer.

E. Block Fillers: Apply block fillers to new or previously unpainted concrete masonry block at a rate to ensure complete coverage with pores filled.

F. Prime Coats: Before application of finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.

G. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

H. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster.

1. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.
2. Provide satin finish for final coats.

I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

3.4 CLEANING:

A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

B. Upon completion of painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping, using care not to scratch or damage adjacent finished surfaces.

3.5 PROTECTION:

A. Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

B. Provide "wet paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINT SCHEDULE:

A. The quantities of coats specified are minimums. Contractor is responsible for application of any additional coats necessary to achieve required coverage and color uniformity.

B. Ferrous Metal Surfaces: Sherwin-Williams (Full-Gloss Acrylic Enamel)

Primer (one coat): Kem Kromik Universal Metal Primer B50NZ6/B50WZ1.
Finish (two coats): DTM Acrylic Coating B66-100 Series Gloss.

C. Galvanized Steel Surfaces: Sherwin-Williams (Full-Gloss Acrylic Enamel)

Primer (one coat): Pro Industrial Pro-Cryl Universal Primer B66-310 Series.
Finish (two coats): DTM Acrylic Coating B66-100 Series Gloss.

D. Aluminum Surfaces: Sherwin-Williams (Full-Gloss Acrylic Enamel)

Primer (one coat): Pro Industrial Pro-Cryl Universal Primer B66-310 Series.
Finish (two coats): DTM Acrylic Coating B66-100 Series Gloss.

3.7 INTERIOR PAINT SCHEDULE:

A. The quantities of coats specified are minimums. Contractor is responsible for application of any additional coats necessary to achieve required coverage and color uniformity.

B. Ferrous Metal Surfaces: Sherwin-Williams (Semi-Gloss Acrylic Enamel)

Primer (one coat): Kem Kromik Universal Metal Primer B50NZ6/B50WZ1.
Finish (two coats): ProMar 200 Zero VOC Interior Latex Semi-Gloss B31-2600 Series

C. Galvanized Steel Surfaces: Sherwin-Williams (Semi-Gloss Acrylic Enamel)

Primer (one coat): Pro Industrial Pro-Cryl Universal Primer B66-310 Series.
Finish (two coats): ProMar 200 Zero VOC Interior Latex Semi-Gloss B31-2600 Series.

D. Existing Painted Metal Surfaces: Sherwin-Williams (Semi-Gloss Acrylic Enamel)

Primer (one coat): DTM Bonding Primer B66A50.
Finish (two coats): ProMar 200 Zero VOC Interior Latex Semi-Gloss B31-2600 Series.

E. Concrete Masonry Unit (CMU) Surfaces: Sherwin-Williams (Semi-Gloss Acrylic Enamel).

New and Bare CMU Surfaces:

Block Filler (one coat): PrepRite Block Filler Interior/Exterior Latex B25W25.
Finish (two coats): ProMar 200 Zero VOC Interior Latex Semi-Gloss B31-2600 Series.

F. Existing Painted (Glossy) Concrete Masonry Unit (CMU) Surfaces: Sherwin-Williams (Semi-Gloss Acrylic Enamel).

Primer (one coat): Extreme Bond Interior/Exterior Bonding Primer B51W00150.
Finish (two coats): ProMar 200 Zero VOC Interior Latex Semi-Gloss B31-2600 Series.

G. Gypsum Board Surfaces: Sherwin-Williams (Flat Acrylic Paint)

Primer (one coat): ProMar 200 Zero VOC Interior Latex Primer B28W02600.
Finish (two coats): ProMar 200 Zero VOC Interior Latex Flat B30-2600 Series.

H. Gypsum Board Surfaces: Sherwin-Williams (Eggshell Latex Acrylic Enamel)

Primer (one coat): ProMar 200 Zero VOC Interior Latex Primer B28W02600.
Finish (two coats): ProMar 200 Zero VOC Interior Latex Eg-Shel B20-2600 Series.

I. Wood Surfaces for Paint Finish: Sherwin-Williams (Semi-Gloss Waterbased Acrylic-Alkyd Enamel)

Primer (one coat): Premium Wall & Wood Primer, B28W8111.
Finish (two coats): ProMar 200 WB Acrylic-Alkyd Semi-Gloss B34-8200 Series.

END OF PAINTING

SECTION 101400

SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. Section Includes: Interior panel sign system.

1.3 SUBMITTALS:

A. Product Data: Submit manufacturer's product information for each type of signage specified.

B. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, grounds, layout, reinforcement, and accessories.
   1. Include fabrication and installation details.
   2. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
   3. Provide copy for each sign required, including large-scale details of wording and lettering layout. Indicate typestyles and graphic elements, including tactile characters and Braille.
   4. Templates: Furnish full-size spacing templates for individually mounted dimensional letters and numbers.

C. Samples: Submit for each type signage system.
   1. For Initial Selection:
      a. Acrylic Sheets: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for acrylic sheet material.
      b. Aluminum: Samples of each finish type and color, on square sheet or plate material, showing the full range of colors available.
   2. For Verification: For each of the following products and for the full range of color, texture, and sign material sizes indicated, of indicated:
      a. Acrylic Sheet: 8 by 10 inches for each color required.
      b. Interior Panel Signs: Not less than 12-inches square indicating representative sample of the graphic image process required, showing graphic style, colors and finishes of letters, numbers, and other graphics.
      c. Trim: 6-inch length sections of each profile.
      d. Accessories: Manufacturer's full-size unit.

D. Sign Schedule: Use same designations indicated on Drawings.

E. Qualification Data: For installer and fabricator. (Submit for Architect's information only.)

F. Maintenance Data: Submit sign manufacturer's cleaning and maintenance instructions to include in maintenance manuals. Submit as part of project closeout documents.

1.4 QUALITY ASSURANCE:

A. Installer Qualifications: Installer shall be trained and approved by manufacturer.

B. Fabricator Qualifications: Fabricator shall be regularly engaged in the custom fabrication of signage products similar to those required for this Project with not less than Five (5) years' experience and whose fabrications have a record of successful in-service performance.

C. Source Limitations for Signs: Obtain each sign type specified from one source and from a single manufacturer.

D. Regulatory Requirements: Comply with applicable provisions of the following standards and regulations.
   1. U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities", herein referred to as ADA-ABA Accessibility Guidelines.
   2. ICC/ANSI A117.1, "Accessible and Usable Buildings and Facilities".
   3. Georgia Insurance and Safety Fire Commissioner, Rules and Regulations of the Office of Safety Fire Commissioner Chapter 120-3-20, "Accessibility Code for Buildings and Facilities," (GA Accessibility Code).

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Aluminum Sheet and Plate: ASTM B 209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 5005-H32.

B. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 6063-T5.

C. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

2.2 INTERIOR PANEL SIGN SYSTEM:

A. Acceptable Manufacturers; Subject to compliance with requirements, provide products by one of the following:
   1. ACE Sign Systems, Inc.
   2. Advance Corporation / Braille-Tac Division.
   3. Allen Industries, Inc.
   4. APCO Graphics, Inc.
   5. Architectural Signing, Inc.
   6. ASI Sign Systems, Inc.
   7. Best Sign Systems.
   8. InPro Corporation.

9. Mohawk Sign Systems, Inc.
10. Nelson-Harkin Industries, Inc.
11. Signage Industries Corporation.

B. Basis of Design: APCO Graphics, Inc.; Accord 15 Modular Sign System.
   1. Sign systems of similar design and construction by other acceptable manufacturers may be submitted for Architect's acceptance.
   2. Acceptance is subject to compliance with specified requirements as evidenced by submittal of manufacturer's product data and samples.

C. Panel Sign System: Modular panel signs with extruded aluminum or injection molded UV and impact resistant plastic frame retainers and with panel inserts fabricated from aluminum or acrylic sheet material.
   1. Frame Edge Profile: As selected by Architect from manufacturer's standard.
   2. Finishes for Frame and Panel Inserts: As selected by Architect from manufacturer's full range color selection.

D. Signage Information:
   1. Letter Style and Sizes: Matching school facility standards.
   2. Sign Sizes: As indicated on shop drawings.
   3. Copy:
      a. Room signs shall include space or room names and numbers.
         1) Space or room names will approximate those as indicated on Contract Drawings with final approval based on Architect’s review of submitted shop drawings.
         2) Space numbers will be established by Architect and may not necessarily be those as indicated on the Contract Drawings. Space numbers will be a minimum of five characters consisting of numbers and letters as established by Architect on shop drawings.
      b. Toilet room signs shall include international graphic symbols for accessibility and gender.
      c. Directional signs shall include space name, numbers and directional arrows.
   4. Tactile Graphics and Text: Raised minimum 1/32-inch (1 mm).
   5. Colors: As selected by Architect and complying with specified school facility standards.

E. Tactile and Braille Sign: Manufacturer's standard process for producing text and symbols complying with ADA-ABA Accessibility Guidelines and with ICC/ANSI A117.1. Text shall be accompanied by Grade 2 Braille. Produce precisely formed characters with square-cut edges free from burrs and cut marks; Braille dots with domed or rounded shape.

F. Fabrication Tolerances: Fabricate signs with smooth panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16-inch measured diagonally from corner to corner.

G. Mounting Method: Manufacturer's concealed mechanical mounting. Provide with fasteners and anchors of types required for attachment to substrates encountered.

H. Sign Locations: Provide panel signs for locations specified. Final locations of signs shall be as indicated on shop drawings.
   1. Room Signs: Provide for each room or space located adjacent to door opening on wall.

Where wall mounting is not practical, mount to door.

2. Directional Signs: Provide at all corridor intersections, waiting areas and public lobby areas.

2.3 ACCESSORIES:

A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for installations as required for corrosion resistance.
   1. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors.
   2. Furnish inserts, as required, to be set into concrete or masonry work.

2.4 FABRICATION:

A. Provide manufacturer's standard signs of configurations indicated.

B. Mill joints to tight, hairline fit.

C. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.

D. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION:

A. Install signage in accord with manufacturer’s product data and final reviewed and accepted shop drawings at heights and locations indicated.

B. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
   1. Install signs level, and plumb with sign surfaces free of distortion and other defects in appearance.
   2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3-inches of sign without encountering protruding objects or standing within swing of door.

C. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.
   1. Mount signs with concealed mechanical fasteners. Use non-removable mechanical fasteners placed through predrilled holes.

2. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

D. Bracket-Mounted Signs: Provide manufacturer's standard brackets, fittings, and hardware for mounting signs that project at right angles from walls and ceilings. Attach brackets and fittings securely to walls and ceilings with concealed fasteners and anchoring devices to comply with manufacturer's written instructions.

3.3 CLEANING AND PROTECTION:

A. After installation, clean soiled sign surfaces according to manufacturer's written instructions.

B. Protect signs from damage until acceptance by Owner.

C. Repair or replace damaged components; repairs shall be indiscernible in the finished work and acceptable to Architect.

END OF SIGNAGE

SECTION 102119

TOILET AND DRESSING COMPARTMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. Section Includes:

1. Solid-plastic toilet compartments, and urinal screens.
2. Solid-plastic dressing compartments.
3. Solid-plastic benches.

B. Related Sections:

1. Division 9 Section – "Gypsum Board Assemblies" for concealed steel strap backing plates for blocking and bracing within metal stud walls for anchorage of compartment and screen components.
2. Division 10 Section - "Toilet Accessories" for toilet tissue dispensers, grab bars, sanitary napkin disposal units, and similar accessories mounted to toilet compartments.

1.3 PERFORMANCE REQUIREMENTS:

A. Surface-Burning Characteristics: Meeting Class B, minimum, when tested according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 75 or less.
2. Smoke-Developed Index: 450 or less.

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's current detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories. Include construction details indicating materials, dimensions of individual components and profiles, and finishes for partition panels.

B. Shop Drawings: Submit for toilet compartments, dressing compartments, urinal screens and benches. Include plans, elevations, sections, details, and attachment details.

1. Show locations of cutouts for compartment-mounted toilet accessories.
2. Show locations for compartment-mounted grab bars.
3. Show locations of centerlines of toilet fixtures.
4. Show overhead support or bracing locations.
5. Show locations of benches, including pedestal supports and methods of anchorage.

6. Indicate attachments to other work.

C. Samples:

1. For Initial Selection: Submit manufacturer's color charts showing the full range of colors, textures, and patterns available for each type of unit indicated.

2. For Verification: Submit the following in manufacturer's standard sizes unless otherwise indicated:
   a. Each type of material, color, and finish required for toilet compartments, prepared on 6-inch square samples of same thickness and material indicated for Work.
   b. Each type of hardware and accessory, if requested by Architect.

D. Maintenance Data: Submit manufacturer's maintenance instruction for care and cleaning of partition panel surfaces to include in maintenance manuals. Indicate recommended cleaning products, methods and maintenance procedures. Include as part of Project Closeout documents.

1.5 QUALITY ASSURANCE:

A. Source Limitations: Obtain toilet compartments, dressing compartments and benches, including hardware and accessories, from a single manufacturer and from a single source.

B. Regulatory Requirements: Comply with applicable provisions of the following regulations and standards for toilet and dressing compartments designated as accessible.

1. Code of Federal Regulations (CFR), Americans with Disabilities Act (ADA), 2010 ADA Standards for Accessible Design.
2. ICC/ANSI A117.1, "Accessible and Usable Buildings and Facilities.

1.6 PROJECT CONDITIONS:

A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication. Allow for adjustments within specified tolerances wherever taking of field measurements before fabrication might delay work.

B. Coordination: Furnish inserts and anchorages which must be built into other work for installation of toilet and dressing partitions and related work; coordinate delivery with other work to avoid delay.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturers; subject to compliance with specified requirements provide products of one of the following:

1. Bradley Corporation.
2. Columbia Partitions / Div. Partition Systems Incorporated of South Carolina.
3. General Partitions Mfg. Corp.
4. Hadrian, Inc.
5. Scranton Products, Inc.

2.2 MATERIALS:

A. Plastic Panels: Manufacturer's solid, high-density polyethylene (HDPE) resin compound molded under pressure into panels of homogeneous color and pattern throughout.

B. Aluminum Castings: ASTM B 26/B 26M.

C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M); alloy as required by manufacturer's fabrication requirements.

D. Brass Castings: ASTM B 584.

E. Brass Extrusions: ASTM B 455.

F. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.

G. Stainless-Steel Castings: ASTM A 743/A 743M.

2.3 SOLID-PLASTIC TOILET AND DRESSING COMPARTMENTS:

A. Compartment and Screen Styles:

1. Toilet-Enclosures: Overhead braced, floor anchored.
2. Dressing-Enclosures: Overhead braced, floor anchored.
3. Urinal-Screens: Wall hung.

B. Door, Panel, Screen, and Pilaster Construction: Fabricated from specified solid polymer panel material.

1. Thickness: 1-inch, minimum.
2. Panel Face and Edges: Seamless face with beveled or rounded eased edges.
3. Heat-Sink Strip: Manufacturer's standard continuous, stainless-steel strip fastened to exposed bottom edges of solid-plastic components to hinder malicious combustion.
4. Color and Pattern: As selected by Architect from manufacturer's full range selection; one color and pattern in each room will be selected.

C. Pilaster Shoes: Manufacturer's standard design; polymer or stainless steel.

1. Polymer Material: Manufacturer's standard in color and pattern matching pilaster.
2. Stainless Steel: Type 304 alloy stainless steel sheet meeting ASTM A 666 or ASTM A 167.

D. Overhead-Bracing (Headrail): Manufacturer's standard continuous extruded aluminum headrail of anti-grip profile, with clear anodized finish.

1. Provide concealed anchorage where possible, with concealed anchorage blocks, and exposed ends neatly closed with either matching end cap and/or filler.
2. Return to side and back/rear walls at ends of runs, and again to back/rear walls at any locations where partition layouts off-set.

E. Brackets (Fittings): Manufacturer's heavy duty full-height continuous length; minimum 16 gauge (0.062-inch) thickness, type 304 stainless steel mounting brackets with pre-drilled holes for attachment of panels and pilasters; satin finish. Provide channel, angle, and double-angle-channel types as required for application conditions. Limit exposed angle flanges to interior of stalls where possible, and where permanence of installation will not be reduced or otherwise affected.

2.4 HARDWARE AND ACCESSORIES FOR COMPARTMENTS AND SCREENS:

A. Continuous Hinges: Manufacturer's full length heavy duty, minimum 14 gauge (0.78-inch) type 304 stainless steel continuous hinge; self-closing multi-cam type; satin finish.

1. Hinges shall be designed for continuous anchorage of door panels to pilasters; pre-drilled to accept specified fasteners spaced at maximum 8-inches on center with first and last holes located not more than 2-inches from each end.
2. Hinge cam shall pre-set door positions with out-swings to normal closed position and in-swings to partial open position.

B. Latch, Strike and Keeper: Manufacturer's heavy duty stainless steel surface-mounted slide latch unit, minimum 14 gauge (0.78-inch) material thickness; satin finish.

1. Strikes shall be of design for emergency access with combination rubber-faced door strike and keeper.
2. Provide units that comply with ADA requirements at compartments designated as accessible.

C. Coat Hooks for Compartments:

1. Bumper and Coat Hook for In-Swinging Doors: Manufacturer's heavy duty stainless steel, minimum 14 gauge (0.78-inch) material thickness, combination bumper and hook; satin finish with rubber bumper; sized to prevent door from hitting compartment-mounted accessories.

2. Coat hook for out-swinging doors: Manufacturer's heavy duty stainless steel design; minimum 14 gauge (0.78-inch) material thickness, satin finish. Coat hook shall be mounted above finish floor at height complying with ADA requirements.

D. Door Pull for Out-Swinging Doors: Manufacturer's heavy duty stainless steel design for mounting on door direct on opposite side of latch and complying with ADA requirements; minimum 14 gauge (0.78-inch) material thickness; satin finish. Provide pulls on both sides of doors at compartments designated as accessible. Mount with through-bolts.

E. Wall Bumper for Out-Swinging Doors: Wall-mounted heavy duty stainless steel type with rubber bumper; satin finish.

F. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads.

1. Provide sex-type bolts for through-bolt applications.
2. For concealed anchors, use stainless-steel, hot-dip galvanized-steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.5 SOLID PLASTIC BENCHES:

A. Type: Compartment manufacturer's solid plastic benches supported with aluminum pedestal bases.

1. Bench Top:

a. Material: High-density polyethylene (HDPE) thermoplastic formed into solid panel components with homogeneous color and pattern throughout.

1) Finish Texture: Manufacturer's smooth orange peel or matte textured surface.

2) Color: As selected by Architect from manufacturer's full range color selection.

b. Edges: Fabricate with edges eased at least 1/4-inch radius.

c. Sizes:

1) Standard Benches: Minimum 9-1/2 inch width by 1-1/2 inch thickness by lengths indicated.

2) Accessible Benches: ADA compliant size by 1-1/2 inch thickness.

a) Length: 42-inch (3'-6"), minimum.

b) Depth: 20-inch (1'-8") minimum, to 24-inch (2'-0") maximum.

2. Back Support: Provide back support for accessible benches complying with ADA design standards.

3. Pedestals: Provide manufacturer's fixed aluminum pedestal bases as specified; spaced at maximum 5-ft.(60-inches) on center.

a. Construction: Heavy duty, extruded aluminum pedestal with stem constructed from minimum 2-inch round or square tubing with welded flange at top and bell-shaped or flat plate base at bottom; predrilled with fastener holes fabricated for attachment of bench top and anchorage to floor substrate.

b. Finish: Manufacturer's powder-coat or anodized finish in color as selected by Architect from manufacturer's full range selection.

4. Bench Height: Minimum 17-inch (1'-5") to maximum 19-inch (1'-7") measured from bench top to finish floor.

B. Hardware Accessories: Provide with anchors and fasteners of types and sizes as recommended by manufacturer for attachment of benches and anchoring of pedestals to floor.

2.6 FABRICATION:

A. Fabricate toilet and dressing compartment components to sizes indicated.

1. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.
2. Verify door clearances with fixtures and coordinate clearances with toilet accessories.

B. Overhead-Braced, Floor-Anchored Partitions: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, fasteners, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

1. Make provisions for setting and securing continuous head rail at top of each pilaster.

2. Provide manufacturer's standard corrosion-resistant anchoring assemblies complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters for connection to floor.
3. Fabricate pilaster shoes to conceal anchorage and leveling mechanism.

C. Urinal-Screens: Fabricate panels for wall hung installation with specified continuous brackets.

D. Door Size and Swings: Unless otherwise indicated, provide toilet and dressing compartments with the following door sizes and swings as specified.
1. Standard Compartments: 24-inch width, in-swinging doors.
2. Accessible Compartments: 36-inch width, out-swinging doors; providing not less than 32-inch wide clear opening when installed.

E. Benches: Fabricate each type bench top units to sizes indicated in single lengths without splices.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.

B. Confirm location and adequacy of blocking and supports required for installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION:

A. Comply with manufacturer's written installation instructions for compartments and screens.
1. Install units rigid, straight, level, and plumb.
2. Secure units in position with manufacturer's recommended anchoring devices.
3. Install panels, doors and pilasters maintaining uniform clearances within specified tolerances.

B. Clearances for Panels, Doors and Pilasters:
1. Between Panel and Pilaster: 1/2-inch maximum, except where concealed fasteners are used.
2. Between Door Edge and Pilaster: 1/4 inch, maximum.
3. Between Panel and Wall: 3/4-inch maximum

C. Full-Height (Continuous) Bracket Installation: Secure panels to walls and to pilasters with full-height brackets.
1. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
2. Align brackets at pilasters with brackets at walls.
3. Attach brackets rigid in place with tamper-resistant fasteners.

D. Overhead-Braced, Floor-Anchored Units:

1. Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions.
2. Secure continuous head rail to each pilaster with not less than two fasteners.
3. Hang doors to align tops of doors with tops of panels and adjust so tops of doors are parallel with overhead brace when doors are in closed position.
4. Brackets: Secure panels to walls and to pilasters with continuous full-length brackets as specified.

E. Wall-Hung Urinal Screens: Install screens to wall construction using mounting brackets at locations indicated with specified fasteners.

1. Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

2. Position, align, level, plumb and square units. Tighten fasteners and secure rigid in place.

F. Fixed Benches: Install to locations indicated according to manufacturer's instructions.
1. Mount bench tops supported by not less than two (2) pedestals, uniformly spaced not more than 5-ft. (60-inches) apart and within 1-ft. from ends.
2. Fasten underside of bench tops secure to pedestals.
3. Anchor pedestal base to floor substrate with bench assembly straight and aligned to locations.

3.3 ADJUSTING AND CLEANING:

A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation.

1. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched.
2. Set hinges on out-swinging doors to return doors to fully closed position.

B. Cleaning: Clean exposed surfaces of toilet compartments, dressing compartments and screens, including hardware by washing using neutral detergent and water. Rinse washed surfaces with clean water and wipe dry with soft, absorbent lint-free cloths.

C. Protection: Provide final protection and maintain conditions that ensure toilet compartments, dressing compartments, screens and benches are without damage or deterioration at the time of Substantial Completion

END OF TOILET AND DRESSING COMPARTMENTS

SECTION 102813

TOILET ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. Section Includes: Toilet room accessories. The extent of toilet and other accessory items are indicated on the Drawings, and include the following:

1. Paper towel dispensers and waste receptacle units.
2. Toilet tissue dispensers.
3. Grab bars.
4. Soap dispensers.
5. Sanitary napkin/tampon disposal units.
6. Coat hooks.
7. Mirror units.

B. Related Section: Division 10 Section – "Toilet and Dressing Compartments."

1.3 SUBMITTALS:

A. Product Data: Submit for each toilet accessory item specified, including details of construction relative to materials, dimensions, gauges, profiles, method of mounting, specified options, and finishes.

B. Setting Drawings: Where cutouts are required in other work, provide templates, substrate preparation instructions, and directions for preparing cutouts and for installation of anchorage devices.

1.4 QUALITY ASSURANCE:

A. Single-Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise acceptable to Architect.

B. Regulatory Requirements: Comply with applicable provisions of the following regulations and standards for toilet and shower accessories installed at locations designated as accessible.

1. Code of Federal Regulations (CFR), Americans with Disabilities Act (ADA), 2010 ADA Standards for Accessible Design.
2. ICC/ANSI A117.1, "Accessible and Usable Buildings and Facilities.

C. Inserts and Anchorages: Furnish inserts and anchoring devices that must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.

1.5 PROJECT CONDITIONS:

A. Coordination: Coordinate accessory locations, installation, and sequencing with other work to avoid interference and to assure proper installation, operation, adjustment, cleaning, and servicing of toilet accessory items.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturers; subject to compliance with specified requirements, provide products by one of the following:

1. AJW Architectural Products (AJW).
2. American Specialties, Inc. (ASI).
3. Bobrick Washroom Equipment, Inc.
4. Bradley Corporation.

2.2 MATERIALS, GENERAL:

A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22-gauge (.034-inch) minimum thickness, unless otherwise indicated.

B. Brass: Leaded and unleaded, flat products, ASTM B 19; rods, shapes, forgings, and flat products with finished edges, ASTM B 16, Castings, ASTM B-30.

C. Sheet Steel: Cold-rolled, commercial quality ASTM A 366, 20-gauge (.040-inch) minimum, unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.

D. Galvanized Steel Sheet: ASTM A 527, G60.

E. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.

F. Baked Enamel Finish: Factory-applied, gloss white, baked acrylic enamel coating.

G. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.

H. Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

I. Keys: Unless otherwise indicated, provide universal keys for access to toilet accessory units requiring internal access for servicing, resupply, etc. Provide minimum of 6-keys to Owner's representative and obtain receipt.

2.3 COMBINATION PAPER TOWEL DISPENSER AND WASTE RECEPTACLE UNITS:

A. Acceptable Products; subject to compliance with requirements:

1. AWJ; Model No. U659EA.
2. ASI; Model No. 046924A.
3. Bobrick; Model No. B-3974.

B. Semi-Recessed Combination Automatic Roll Paper Towel Dispenser and Waste Receptacle: Minimum 24-gauge stainless steel welded cabinet construction with full continuous backs and sides.

1. Towel Dispenser: Automatic dispensing with battery powered electronic sensor having paper towel roll capacity of 8-inch diameter, 800 ft. length; housed in enclosed stainless steel cabinet. Door shall be equipped with tumbler lockset.
2. Waste Receptacle: 12-gallon, minimum capacity; container fabricated from minimum 22-gauge stainless steel welded construction.
3. Liner: Equip with manufacturer's reusable, heavy duty vinyl liner designed to fit inside waste receptacle.
4. Lockset: Tumbler type for towel-dispenser compartment and waste receptacle; keyed alike to other specified accessories.

C. Mounting Height: Not more than 3'-8" A.F.F. to towel dispensing opening.

2.4 TOILET TISSUE DISPENSERS:

A. Toilet Paper Dispenser -- Surface-Mounted

1. Acceptable Products; subject to compliance with requirements:
   a. AWJ; Model No. U840.
   b. ASI; Model No. 0030.
   c. Bobrick; Model No. B-2888.
   d. Bradley; Model No. 5402.
2. Description: Surface- mounted toilet tissue dispenser; holds two tissue rolls housed in cabinet with lockable service door.
   a. Material and Finish: Type 304 stainless steel, No. 4 satin finish.
   b. Cabinet Body: Minimum 22-gauge (0.031-inch) thickness, welded construction.
   c. Door: Minimum 22-gauge (0.031-inch) thickness, one-piece seamless construction; fitted with keyed tumbler lock.
   d. Spindles: Theft-resistant, molded polyethylene spindles with heavy duty internal springs.

2.5 GRAB BARS:

A. Manufacturer/Series No. - Straight Bars:

1. AWJ; UG3-A Series.
2. ASI; Series 3800 P.
3. Bobrick; Series B-6806.99.

4. Bradley; Series 812-2.

B. Stainless Steel Type: Provide 1-1/2-inches outside diameter heavy-duty grab bars with wall thickness not less than 18-gauge (.050-inch) and as follows:

1. Mounting: Concealed type, manufacturer's standard snap-on flange covers and anchorage with concealed mounting plate.
2. Clearance: 1-1/2-inches clearance between wall surface and inside face of bar.
3. Gripping Surfaces: Manufacturer's standard nonslip texture.
4. Locations, Size, and Configurations: As indicated on the Drawings.

C. Mounting Height:

1. Horizontal Bars: 33-inches A.F.F. to horizontal centerline.
2. 18-inch Vertical Bars At Toilets: 39-inches A.F.F. and 41-inches from wall behind toilet fixture to vertical centerline, and as otherwise required by ANSI A 117.1.

2.6 SOAP DISPENSERS:

A. Automatic Soap Dispenser – Surface-Mounted:

1. Acceptable Products; subject to compliance with requirements:
   a. AWJ; Model No. U135EA.
   b. ASI; Model No. 0362.
   c. Bobrick; Model No. B-2012.
   d. Bradley: Model No. 6A00.
2. Description: Tank type vertical surface-mounted soap dispenser with sensor-activated valve designed to dispense liquid or lotion soaps.
   a. Operation: Automatic soap dispensing with battery powered electronic infrared sensor. Equip with LED in sensor to indicate function and battery status.
   b. Valve and Pump: Hands-free sensor-activated motorized pump connected to corrosion-resistant type valve designed to dispense specified soap solution.
   c. Housing Body: Minimum 22-gauge (0.031-inch) thickness, type 304 stainless steel body, one-piece seamless construction; satin finish.
   d. Soap Container: Rigid, translucent, polyethylene, equipped with filler cap for servicing.
   e. Capacity: Minimum 27 fluid ounce (800 milliliter).

2.7 SANITARY NAPKIN DISPOSAL UNITS:

A. Surface-Mounted Units:

1. Acceptable Products; subject to compliance with requirements:
   a. AWJ; Model No. U582.
   b. ASI; Model No. 0473-A.
   c. Bobrick; Model No. B-254.

d. Bradley; Model No. 4722-15

2. Description: Surface mounted sanitary napkin disposal unit.

a. Material and Finish: Type 304 stainless steel, No. 4 satin finish.

b. Cabinet Body: Minimum 22-gauge (0.031-inch) thickness, welded construction.

c. Door: Where required by manufacturer's design, fabricated from minimum 22-gauge (0.031-inch) thickness, one-piece seamless construction attached with full length stainless steel multi-staked continuous hinge and fitted with keyed tumbler lock.

d. Flap Door: Minimum 22-gauge (0.031-inch) thickness with hemmed bottom edge and spring-loaded, self-closing, full length stainless steel continuous hinge.

e. Waste Container: Minimum 22-gauge (0.031-inch) thickness welded stainless steel container or rigid molded polyethylene receptacle housed in lockable cabinet per manufacturer's design. Container shall be of removable design for servicing.

f. Capacity: 1.2-gallon, minimum.

g. Liners: Provide each unit with one (1) box of disposable liners. Deliver to Owner and obtain a receipt.

B. Mounting Height:

1. Standard Toilet Fixtures: 34-inches A.F.F., to top of unit

2. Accessible (H.C.) Toilet Fixtures: 30-inches A.F.F. to top of unit, unless otherwise required to comply with accessibility requirements.

3. Coordinate exact location related to door swing, toilet fixture and other accessories with Architect and Owner prior to installation.

2.8 COAT HOOKS:

A. Acceptable Products; subject to compliance with requirements:

1. AWJ; Model No. UX110-BF.

2. ASI; Model No. 7340.

3. Bobrick: Model No. B-671.

4. Bradley: Model No. 9115.

B. Design: Rectangular projecting tubular post hook with wall flange cover and concealed fastener mounting bracket.

1. Material and Finish: Type 304 stainless steel, bright polished finish.

2. Size: 2-inch by 2-inch flange with 2-inch approximate length projecting post hook.

C. Mounting Height: 54-inches A.F.F. to top of horizontal projection of robe hook; 48-inches A.F.F. at accessible stalls and toilet rooms for the disabled and handicapped.

D. Locations: Provide two in each individual dressing compartment mounted to walls at locations as directed by Architect.

2.9 MIRROR UNITS:

A. Acceptable Products; subject to compliance with requirements:

1. AWJ; Model No. U711 Series.
2. ASI; Model No. 0620-A.
3. Bobrick: Model No. B-165 Series.
4. Bradley: Model No. 781 Series.

B. Description: Channel frame mirror units.

1. Frame: Stainless-steel channel, 0.036-inch minimum thickness, with mitered and mechanically interlocked corners.
2. Mirror: No.1 quality, silver coated and hermetically sealed, uniform coated electrolytic copper-plated float or plate glass meeting ASTM C 1503; 1/4–inch (6 mm) nominal thickness.
3. Hangers: Rigid, tamper- and theft-resistant type using wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.
4. Sizes: As indicated on drawings.

C. Mounting Height: 38-inches A.F.F. to bottom of mirror, unless otherwise indicated.

2.10 FABRICATION:

A. Manufacturer's Identification: Only a maximum 1-1/2-inch diameter, unobtrusive stamped logo of manufacturer, as approved by Architect, is permitted on an inconspicuous face of toilet or bath accessory units. Identification mark shall be located on either interior surface not exposed to view or back surface, provide additional identification by means of either a printed, waterproof label or a stamped nameplate, indicating manufacturer's name and product model number.

B. Surface-Mounted Toilet Accessories: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.

C. Recessed Toilet Accessories: Except where otherwise indicated, fabricate units of all welded construction, without mitered corners. Hang doors or access panels with full-length stainless steel piano hinge. Provide anchorage that is fully concealed when unit is closed.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Install toilet accessory units in accordance with manufacturers' current written instructions, using fasteners appropriate to substrate and recommended by manufacturer of unit.

B. Install units plumb and level, firmly anchored in locations and at heights indicated.

C. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

1. Anchor grab bar to metal stud partitions using manufacturer's minimum 12-gauge (0.109-inch) thickness by 3-inches width steel anchor plates tapped to receive machine screws. Anchor plates shall be of continuous length required to facilitate attachment of grab bars, spanning between studs.
   a. Attach anchor plates to studs at grab bar mounting heights, using self-tapping sheet metal screws or by welding.
   b. Where grab bar mounting flanges require attachment at different walls or at vertical or angled positions, provide anchor plates of lengths to span between studs at each flange location.
   c. Secure grab bars to anchor plates using 1/4-inch diameter stainless steel machine screws.
2. Mount grab bars to masonry and concrete walls using 1/4-inch diameter stainless steel machine screws and expansions shields.

D. Baby Changing Station: Install to withstand specified load capacity when opened. Attach direct to supporting framing in wall construction using fasteners recommended by manufacturer.

3.2 ADJUSTING AND CLEANING:

A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.

B. Clean and polish all exposed surfaces in strict accordance with manufacturer's recommendations after removing temporary labels and protective coatings.

END OF TOILET ACCESSORIES